Mathematics

1983 - 2004

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Past Questions

# Mathematics 1983

1. If M represents the median and D the mode of the measurements 5, 9, 3, 5, 8 then (M,D) is
2. If x + 2 and x – 1 are factors of the expressions lx + 2kx2 + 24, find the values of l and k

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | (6,5) | B. | (5,8) | C. | (5,7) | A. l = -6, k = -9 | B. l=-2,k =1 C. l=-2, k=-1 |
| D. | (5,5) | E. | (7,5) |  |  | D. l = 0, k = 1 | E. l = 6, k = 0 |

1. A construction company is owned by two partners X and Y and it is agreed that their profit will be divided in the ratio 4:5. at the end of the year. Y received #5,000 more than x. what is the total profit of the company for the year?

##### #20,000.00 B. P’0#25,000.00 C. #30,000.00

D. #15,000.003 E.#45,000.00

1. Given a regular hexagon, calculate each interior angle of the hexagon.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 600 | B. | 300 | C. | 1200 |
| D. | 450 | E. | 1350 |  |  |

1. Solve the following equations 4x – 3 = 3x + y = 2y + 5x – 12
   1. 4x = 5, y= 2 B. x= 2, y= 5 C. x =-2, y= -5

D. x = 5, y= -2 E. x = -5, y= -2

1. If x = 1 is root of the equation

x3 – 2x2 – 5x + 6, find the other roots

* 1. -3and2 B. –2 and 2 C. 3 and–2

D. 1 and 3 E. –3and 1

1. If x is jointly proportional to the cube of y and the fourth power of z. In what ratio is x increased or decreased when y is halved and z is doubled?
   1. 4:1 increase B. 2:1 increase C. 1:4 decrease

D. 1: 1 no change E. 3: 4 decrease

1. **P Q**



**45O**

**60O**

**8 cm**

**S R**

In the above figure PQR = 600, QPR = 900, PRS = 900, RPS = 450, QR= 8cm. Determine PS

A. 23cm B. 46cm C. 2cm

D. 86cm E. 8cm

1. Given that cos z = L, where z is an acute angle find an expression for Co +Z - cosec~~z~~

sec Z + tan ~~z~~

* 1. l - L B. L2-L2 C. -L-L

1+L L2+L-1 (C1+L) +L

D. L. E. L-(L2-1)

(L1+L2) +L2 1+ 1 - L2+ 1 - L2

1. If 0.0000152 x 0.00042 =Ax 108, where
2. Make T the subject of the equation

av = 3 2V + T 1- V a 2T

* 1. 3av/(1-v) B. 2v(1-v)2 - a2v2/2a2v2 - (1-V)2

1. 2v(1 - v)2 + a3v2/ 2a2v2 + (1 - v)2
2. 2v(1 - v)2 - a4v3/2a3v3 - (1 - v)3
3. 2v(1-v)3 - a4v3/2a3v3 + (1-v)3



**Additional Mathematics (2*x*-24)O**

**Biology (3*x*-18)O**

***x*O**

**Geography**

**(*x*+12)O**

**French**

**(2*x*+12)O**

**History**

In a class of 60 pupils, the statistical distribution of the number of pupils offering Biology, History, French, Geography and Additional Mathematics is as shown in the pie chart above. How many pupils offer Additional Mathematics?

##### 15 B. 10 C. 18

D. 12 E. 28

13 The value of (0.303)3 – (0.02)3 is

##### A. 0.019 B. 0.0019 C. 0.00019

D. 0.000019 E. 0.000035

1. y varies partly as the square of x and y partly as the inverse of the square root of x. write down the expression for y if y = 2 when x = 1 and y = 6 when x = 4
   1. y = 10x2 + 52 B. y = x2 + 1

31 31x x

C. y = x2 + 1 D. y= x2 + 1 E. y = 10 (x2 + 1 )

x 31 31 x 31( x)

1. Simplify (x – 7) / (x2 – 9) ( x2 – 3x)/( x2 - 49)
   1. x/(x-3)(x+7) B. (x+3)(x+7)/x C. x/(x-3) (x- 7)

D. x/(x+3)(x+7) E. x/(x+4)(x+7)

1. The lengths of the sides of a right-angled triangle at (3x

+ 1)cm, (3x - 1)cm and x cm.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 2 | B. | 6 | C. | 18 |
| D. | 12 | E. | 0 |  |  |

1. The scores of a set of a final year students in the first semester examination in a paper are 41,29,55,21,47,70,70,40,43,56,73,23,50,50. find themedian

of the scores.

1 £ A < 10, find A and B. A. 47 B. 481/ C. 50

2

* 1. A= 9, B = 6`.38 B. A= 6.38, B = -9 C. A= 6.38, B = 9

D. A= 6.38, B = -1 E. A= 6.38, B = 1

##### D. 48 E. 49

***y***

**12**

**9**

**6**

**3**

**-3 -2 -1 -3 3 2 1**

**-6**

**-9**

**-12**

**-15**

***x***

Which of the following equations represents the above graph?

A. y= 1+ 2x + 3x2 B. y= 1 – 2x+ 3x2 C. y= 1 + 2x3x2 D. y= 1 – 2x – 3x2 E. y= 3x2+2x-1



**H**

***x***

**30O**

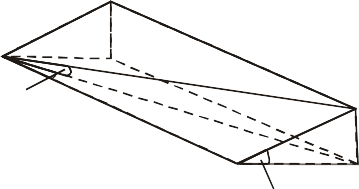
**G**

**K F**

The above figure FGHK is a rhombus. What is the value of the anglex?

##### A. 900 B. 300 C. 1500

D. 120**S**0 E. 600

**0-8 m**

**P**

**0 R**

##### –28,7 B. 6,-28 C. 6,-1

D. –1, 7 E. 3,2

25. Find the missing value in the following table.

**x**

**y = x3O - x + 3**

**-2 -1 0 1 2 3**

**3 3 3 9 27**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | -3 | B. | 3 | C. | –9 |
| D. | 13 | E. | 9 |  |  |

26.



**O**

***x*O**

**130O**

If O is the centre of the circle in the figure above. Find the value of x

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 50 | B. | 260 | C. | 100 |
| D. | 65 | E. | 130 |  |  |

1. Find the angle of the sectors representing each item in a pie chart of the following data. 6,10,14,16,26

##### A. 150,250,350,400,650, B.600,1000,1400,1600,2600

C. 60,100,140,160,260, D.300,500,700,800,1300

E. None ofthe above

1. The scores of 16 students in a Mathematics test are 65,65,55,60,60,65,60,70,75,70,65,70,60,65,65,70

What is the sum of the median and modal scores?

**2 m**

**Q**

**30O**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 125 | B. | 130 | C. | 140 |
| D. | 150 | E. | 137.5 |  |  |

1. The letters of the word MATRICULATION are cut and

PQRS is a desk of dimensions 2m x 0.8m which is inclined at 300 to the horizontal. Find the inclination of the diagonal PR to the horizontal.

put into a box. One of the letter is drawn at random from the box. Find the probability of drawing a vowel.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 23035’ | B. | 300 | C. | 15036’ | A. | 2/13 | B. | 5/13 | C. | 6/13 |
| D. | 100 | E. | 10042’ |  |  | D. | 8/13 | E. | 4/13 |  |  |

1. Find x if(x base 4)2 = 100 1000base 2 30. Correct each of the number 59.81789 and 0.0746829 to

##### 6 B. 12 C. 100

D. 210 E. 110

three significant figures and multiplythem, giving your answer to three significantfigures.

1. Simplify log a1/2 + 1/4log a – 1/12log a7

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 4.46 | B. | 4.48 | C. | 4.47 |
| D. | 4.49 | E. | 4.50 |  |  |

10 10 10

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 1 | B. | 7/6log10a C. | 0 |  |  |  |  |  |  |  |
| D. | 10 | E. | a |  | 31. | If a rod of length 250cm is measured as 255cm longer in  error, what is the percentage error in measurement? | | | | | |
| 23. If w varies inversely as V and u varies directly as w3, | | | | |  | A. | 55 | B. | 10 | C. | 5 |
| find the relationship between u and V given that u = 1, | | | | |  | D. | 4 | E. | 2 |  |  |
| when V = 2 | | | | | | | | | | | |
| A. | u= 8V3 B. | | u= 2 V C. | V = 8/u2 | 32. | If (2/3)m (3/4)n = 256/729, find thevalues of m and n | | | | | |
| D. | V= 8u2 E. | | U= 8/v3 |  |  | A. m=4, n = 2 B. m=-4, n =-2 C. m=-4,n =2 | | | | | |
|  |  | |  |  |  | D. m=4,n =-2 E. m=-2,n =4 | | | |  |  |



24. Solve the simultaneous equations for x x2 + y – 8 = 0

y + 5x – 2 = 0

1. Without using tables find the numerical value of log749

+ log7(1/7)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 1 | B. | 2 | C. | 3 |
| D. | 7 | E. | 0 |  |  |

1. Factorize completely 81a4 – 16b4
2. (3a + 2b) (2a – 3b) (9a2 + 4b2)
3. (3a - 2b) (2a – 3b) (4a2 - 9b2)
4. (3a - 2b) (3a – 2b) (9a2 + 4b2)
5. (3a - 2b) (2a – 3b) (9a2 + 4b2)
6. (3a - 2b) (2a – 3b) (9a2 - 4b2)
7. One interior angle of a convex hexagon is 1700 and each of the remaining interior angles is equal to x0. find x

##### 1200 B. 1100 C. 1050

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| D. | 1020 E. | 1000 | A. | 661/ 0 | B. | 621/ 0 | C. | 1250 |
|  |  |  |  | 2 |  | 2 |  |  |
|  |  |  | D. | 1050 | E. | 650 |  |  |

41. In the figure below find PRQ

**R**



**235**

o

**Q**

**P**

1. PQRS is a cyclic quadrilateral in which PQ = PS. PT is a tangent to the circle and PQ makes and angle 500 with the tangent as shown in the figure below. What is the size of QRS?

42.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Simplify 27a9/8 | | | | | |
| A. | 9a2/2 | B. | 9a3/2 | C. | 2/3a2 |
| D. | 2/3a2 | E. | 3a3/2 |  |  |

43.

**Okro**

**Beans 14.5**

**14.5 kg kg**

**Yams**

**184.5 kg**

**Rice 45.4**

**kg**

**S**



**R**

**Q**

**50O**

**P T**

##### 500 B. 400 C. 1100

##### D. 800 E. 1000

1. A ship H leaves a port P and sails 30km due South. Then it sails 60km due west. What is the bearing of H from P?

##### 26034’ B. 243026’ C. 116034’

##### D. 63026’ E. 2400

1. In a sample survey of a university community the following table shows the percentage distribution of the number of members perhousehold.

44.

The farm yields of four crops on a piece of land in Ondo are represented on the pie chart above. What is the angle of the sector occupied by Okro in the chart?

##### A. 911/ 0 B. 191/ 0 C. 331/ 0

2 3 3

D. 110 E. 910



***(x+3y)*O**

**45O**

**Q *y*O**

***(3x+y)*O**

**P**

**R**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No of members**  **per household 1 2** | **3 4** | **5 6** | **7 8** | **Total** |
| **Number of**  **households 3 12** | **15 28** | **21 10** | **7 4** | **100** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 4 | B. | 3 | C. | 5 |
| D. | 4.5 | E. | None |  |  |

1. On a square paper of length 2.524375cm is inscribed a square diagram of length 0.524375. find the area of the paper no covered by the diagram correct to 3 significant figures.

A. 6.00cm2 B. 6.10cm2 C. 6.cm2

D. 6.09cm2 E. 4.00cm2

1. If f(X) = 1 + x - 1 find f(1-x)

x-1 x2-1

In the figure above, PQR is a straight line. Find the values of x and y

* 1. x = 22.50 and y = 33.750
  2. x = 150 and y = 52.50
  3. x = 22.50 and y = 45.00
  4. x = 56.250 and y = 11.50
  5. x = 18.0 and y = 56.50

1. PQR is the diameter of a semicircle RSP with centre at Q and radius of length 3.5cmc. if QPT = QRT = 600. Find the perimeter of the figure (PTRS p = 22/7)

**S**



**60O O**

**60O**

* 1. 1/x + 1/(x+2) B. x +1/(2x -1) **P R**

1. -1/x - 1/(x-2) D. -1/x + 1/(x2-1)

**T**

* 1. 25cm B. 18ccm C. 36cm

1. 29cm E. 25 5 cm
2. In a triangle PQR, QR = 3cm, PR = 3cm, PQ = 3cm and PQR = 300. find angles P and R  
   1. P = 600 and R = 900
   2. P = 300 and R = 1200
   3. P = 900 and R = 600
   4. P = 600 and R = 600
   5. P = 450 and R = 1050
3. **Q 30O**

**T**



**O**

***x*O**

***x*O**

**2*x*O**

**P**

### P Q



**S**

**R**

**130O**

**100O**

In the above diagram if PS = SR and PQ//SR. what is the size of PQR?

##### A. 250 B. 500 C. 550

D. 650 E. 750

In the figure above PT is a tangent to the circle with centre O. if PQT = 300. find the value of PTO

##### A. 300 B. 150 C. 240

D. 120 E. 600

50 A man drove for 4hours at a certain speed, he then doubled his speed and drove for another 3 hours. Altogether he covered 600km. At what speed did he drive for the last 3 hours?

1. 120km/hr B. 60km/hr C. 600/7km/hr

D. 50km/hr E. 100km/hr.

1. Find the mean of the following 24.57,25.63,25.32,26.01,25.77

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A. | 25.12 B. | 25.30 | C. | 25.26 |
| D. | 25.50q E. | 25.73 |  |  |

# Mathematics 1984

1. Simplify (2/3 – 1/5) – 1/3 of 2/5

3 – 1/ 1/2

##### 1/7B. 7 C. 1/3

D. 3 E. 1/5

1. If 263 + 441 = 714, what number base has been used?

##### 12 B. 11 C. 10

D. 9 E. 8

1. 0.00014323/1.940000 = k x 10n where 1 £ k < 10 and n is
2. A man invested a total of #50,000 in two companies. If these companies pay dividend of 6% and 8% respectively, how much did he invest at 8% if the total yield is #3.700?

##### #15,000 B. #29,600 C. #21,400

D. #27,800 E. #35,000

1. Thirty boys and x girls sat for a test. The mean of the boys’ scores and that of the girls were respectively 6 and 8. find x if the total score was 468.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| a whole | number. The values of K and are | A. | 38 | B. | 24 | C. | 36 |
| A. | 7.381 and –11 B. 2.34 and10 | D. | 22 | E. | 41 |  |  |
| C. | 3.87 and 2 D. 7.831 and–11 |  |  |  |  |  |  |

E 5.41 and–2

1. P sold his bicycle to Q at a profit of 10%. Q sold it to R for #209 at a loss of 5%. How much did the bicycle cost P?
2. The cost of production of an article is made up as follows Labour #70

Power #15

Materials #30

Miscellaneous #5

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A. | #200 | B. | #196 | C. | #180 | Find the angle of the sector representing labour in a pie | | | | | |
|  | D. | #205 | E. | #150 |  |  | chart. |  |  |  |  |  |
|  |  |  |  |  |  |  | A. | 2100 | B. | 1050 | C. | 1750 |
| 5. | If the price of oranges was raised by 1/2k per orange, | | | | | | D. | 1500 | E. | 900 |  |  |

the number of oranges customer can buy for #2.40 will be less by 16. What is the present price of an orange?

* 1. 21/ k B. 31/ k C. 51/ k

1. Bola chooses at random a number between 1 and 300. What is the probability that the number is divisible by

2 2 2 4?

1

D. 20k E. 21 / k

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 1/3 | B. | ¼ | C. | 1/5 |
| D. | 4/300 | E. | 1/300 |  |  |

2

1. Find without using logarithm tables, the value of Log327 – Log1/464

Log31/81

19. In a racing competition. Musa covered a distance of 5xkm in the first hour and (x + 10)km in the next hour. He was second to Ngozi who covered a total distance of 118km

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A. | | 7/4 | B. | –7/4 | C. | –3/2 | in the two hours. Which of the following inequalities is | | | | | |
| D. | | 7/3 | E. | –1/4 |  |  | correct? | | | | | |
| 11. | A variable point P(x, y) traces | | | | a graph | in a two | A.  C. | 0 < -x < 15  15 <x < 18 | | B.  D. | –3 < x < 3  0 < x < 15 | |
|  | dimensional plane. (0, -3) is one | | | | position | of P. If x | E. | 0 < x < 18 | |  |  | |
| increases by 1 unit, y increases by 4 units. The equation  of the graph is 20. 2x + 3y = 1 and y = x – 2y = 11, find (x + y) | | | | | | | | | | | | |
| A. | | -3 = y + 4/ x + 1 | | B. | 4y = -3 + x | | A. | 5 | B. | –3 | C. | 8 |
| C.  E. | | y/x = -3/4  4y = x + 3 | | D. | y + 3 = 4x | | D. | 2 | E. | 2 |  |  |

1. A trader in a country where their currency ‘MONT’ (M) is in base five bought 103(5) oranges at M14(5) each. If he sold the oranges at M24(5) each, what will be his gain?
2. Tunde and Shola can do a piece of work in 18days. Tunde can do it alone in x days, whilst Shola takes 15 days longer to do it alone. Which of the following equations is satisfied by x?
   1. x2– 5x– 18 = 0 B. x2 – 20x+360 =0

2 2

* + 1. M103 (5) B. M1030(5) C. M102 (5) C. x -21x–270=0 D. 2x +42x–190=0

1. M2002(5)
2. Rationalize

E. M3032(5)

(55 - 75)(/7 - 5

1. 3x2–31x+150=0
2. If fx) = 2(x - 3)2 + 3(x - 3) – 4 and g(y) = 5 + y, find g(f(3)) and g{f(4)}
   1. -235 B. 47 - 65 C. -35 A. 3 and 4 B. –3 and 4

D.

Simplify

##### 47 - 85 E. 35 C.

E.

3n – 3n – 1

–3 and –4

0 and 5

D. 3 and –4

33 x 3n – 27 x 3n– 1 23. The quadratic equation whose roots are 1 - 13 and 1 +

##### A. 1 B. 0 C. 1/27

D. 3n – 3n – 1 E. 2/27

13 is

1. x2+(1-13)x+1+13=0
2. x2+(1-13)x+1-13=0
3. p varies directly as the square of q an inversely as r. if C. x2+2x+12=0 D. x2 –2x+ 12=0 p = 36, when q = 3 and r = p, find p when q = 5 and r = 2 E. x2– 2x–12=0

##### 72 B. 100 C. 90

D. 200 E. 125 24. Find a factor which is common to all three binomial expressions

1. Factorise 6x2 – 14x - 12 4a2 – 9b2, a3 + 27b3, (4a + 6b)2

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A. | 2(x + 3) (3x - 2) B. | 6(x - 2) (x + 1) | A. | 4a + 6b | B. | 4a – 6b |
| C.  E. | 2(x - 3) (3x + 2) D. (3x + 4) (2x + 3) | 6(x + 2) (x - 1) | C.  E. | 2a + 3b none | D. | 2a – 3b |

1. A straight line y = mx meets the curve y = x2 – 12x + 40 in two distinct points. If one of them is (5,5), find the other

25.

**P**

**5 cm**

**11 cm**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A. | (5,6) | B. | (8,8) | C. | (8,5) | **Q** |
| D. | (7,7) | E. | (7,5) |  |  |  |

1. The table below is drawn for a graph y = x2 – 3x + 1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **x -3** | **-2 -1** | **0 1** | **2** | **3** |
| **y=x2 - 3x + 1 1** | **-1 3** | **1 -1** | **3** | **1** |

From x = -2 to x = 1, the graph crosses the x-axis in the range(s)

* 1. -1 < x < 0 and 0 < x < 1
  2. -2 < x < -1 and 0 < x < 1
  3. -2 < x < -1 and 0 < x < 1

**S**

**R 4 cm T**

What is the volume of the regular three dimensional figure drawn above?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A. | 160cm3 B. | 48cm3 | C. | 96cm3 |
| D. | 120cm3 E. | 40cm3 |  |  |

1. If (x - 2) and (x + 1) are factors of the expression x3 + px2
   1. 0 < x < 1 E. 1 < x < 2 + qx + 1, what is the sum of p and q?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 0 | B. | –3 | C. | 3 |
| D. | –17/3 | E. | –2/3 |  |  |

1. A cone is formed by bending a sector of a circle having an angle of 2100. Find the radius of the base of the cone if the diameter of the circle is base of the cone if the diameter of the circle is 12cm
   1. 7.00cm B. 1.75cm C. Ö21cm

D. 3.50cm E. 2Ö21cm

34.



**Y**

**X 120**

**5 cm**

**3 cm**

**Z**

Find the area of the shaded portion of the semi – circular figure above.



***r***

***r***

***r***

**60O**

**60O 60O**

***r***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | A. | r2/4(4p - 3 | 3) | B. | r2/4(2p + 3 3) |
|  | C. | 1/2r2p |  | D. | 1/8r 3 |
|  | E.  **P** | r2/8(4p + 3 | 3) | |  |
| 35. |  |  | |  |

UsingXYZ in the figure above find XYZ



**44O**

***r***

**20O**

**Q**

***y***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 290 | B. | 31020’ | C. | 310 |
| D. | 31018’ | E. | 590 |  |  |

1. The sides of a triangle are (x + 4)cm, x cm and (x- 4) cm **S**

respectively. If the cosine of the largest angle is 1/5, find the value of x

* 1. 24cm B. 20cm C. 28cm

**D.** 88/7ccm E. 0cm **R**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | In the figure above QRS is a line, PSQ = 350 SPR = 300 | | | | | | | |
| 30. | If a = 2x/1 – x and b = 1 + x / 1 – x  then a2 – b2 in thesimplest form is | | | | | |  | | and O is the centre of the circle find OQP  A. 350 B. 300 C. 1300 | | | | | | | |
|  | A.3x+1/(x-1) B. 3x2-1/(x-1)2 | | | | | |  | | D. 250 E. 650 | | | | | | | |
|  | C. 3x2+1/(1-x)2 D. 5x2-1/(1-x)2  E. 5x2-2x-1/(1-x)2 | | | | | | 36. | | If pq + 1 = q2 and t = 1/p – 1/pq | | | | | | | |
|  | ( x-1) | | | | | |  | | express t in terms of q | | | | | | | |
| 31. | Simplifty (1 + 1 ) (x+2) | | | | | |  | | A. 1/p – q B. 1/ q – 1 | | | | | | | |
|  | ( x+1) | | | | | |  | | C. 1/q + 1 D. 1 + q  E. 1/ 1- q | | | | | | | |
| A.  C. | | | (x2 - 1)(x + 2)  x2 - (x + 2) | | B.  D. | | x2 (x + 2)/x + 1  2x(x + 2) | 37. The cumulative frequency function of the data below | | | | | | | | |
| E. | | | 2x(x + 2)/x + 1 | |  | |  | is given by the frequency y = cf(x). what is cf(5)? | | | | | | | | |
|  | | | | | | | | | | Scores(n) | | | Frequency(f) | | |
| 32. | | **Q** | | | | | | | | 3 | | | 30 | | |
|  | | | |  | |  | | | |  | 4 |  |  | 32 |  |
|  | | | |  | |  | | | |  | 5 |  |  | 30 |  |
| **P** | | | |  | | **R** | | | |  | 6 |  |  | 35 |  |
|  | | | |  | |  | | | |  | 7 |  |  | 20 |  |
|  | | | | **V** | |  | | | | A. | 30 | B. | 35 | C. | 55 |
|  | | | |  | |  | | | | D. | 62 | E. | 92 |  |  |

**W S** 38. In the figure determine the angle marked y

##### A. 660 B. 1100 C. 260

D. 700 E. 440

**T**

**P**



**44O**

**Q**

In the figure above PQRSTW is a regular hexagon. QS intersects RT at V. calculate TVS.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A. | 600 | B. | 900 | C. | 1200 | ***r*** |
| D. | 300 | E. | 800 |  | **20O** |  |

1. Find the integral values of x which satisfy the **S**

inequalities –3 < 2 –5x < 12

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | -2, -1 | B. | –2, 2 | C. | –1, 0 |
| D. | 0,1 | E. | 1,2 |  | ***y***  **R** |

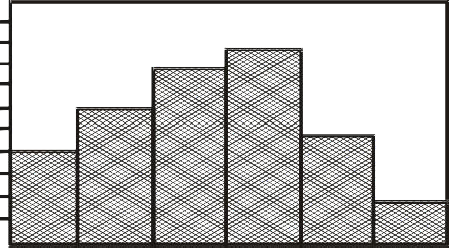
* 1. A right circular cone has a base radius r cm and a vertical 2y0. the height of the cone is

|  |  |  |  |
| --- | --- | --- | --- |
| A. | r tan y0cm | B. | r sin y0cm |
| C. | r cot y0cm | D. | r cos y0cm |
| E. | r cosec y0cm |  |  |

* 1. Two fair dice are rolled. What is the probability that both show up the same number of point?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 1/36 | B. | 7/36 | C. | ½ |
| D. | 1/3 | E. | 1/6 |  |  |

45. **Bar Chart**

**10**

**8**

**Frequency**

**6**

**4**

**2**

**0**

* 1. The larger value of y for which (y - 1)2 = 4y – 7 is
     1. 2 B. 4 C. 6

D. 7 E. 8

**0-9 10-19 20-29 30-39 40-49 50-59**

**Marks**

The bar chart above shows the mark distribution in a class test. Find the number of students in the class.



***y***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 9 | B. | 2 | C. | 60 |
| D. | 30 | E. | 34 |  |  |

46.



**S**

**T**

**135O**

**O**

**R**

**P**

***x***

Find the x coordinates of the points of intersection of the two equations in the graph above.

**Q**

In the figure above, O is the centre of circle PQRS and PS//RT. If PRT = 1350, then PSQ is

##### A. 671/ 0 B. 450 C. 900

1. 333/2 0 E. 221/ 0

4 2

44.

1. y2 – x2/y

### S T



**P**

**6 cm**

**R**

**Q**

**8 cm**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A. | 1,1 | B. | 0,-4 | C. | 4,9 | 47. | XYZ is a triangle and XW is perpendicular to YZ at W. | | |
|  | D. | 0,0 | E. | 0,4 |  | |  | if XZ = 5cm and WZ = 4cm, calculate XY. | | |
|  |  | | | |  | |  | A. | 53cm B. | 35cm C. 3Ö3cm |
| 43. | If sin q = x/y and 00 < q < 900 | | | |  | |  | D. | 5cm E. | 6cm |
|  | then find 1/ tan q | | |  |  | |  |  |  |  |
|  | A.  C. | x/y2 – x2)  y2 –n2 | | B. | x/y | |  |  | **X** |  |
|  |  | yx |  | D. | y2 – x2)/y2 – x2) | |  |  |  |  |

**** **12 cm**

In the figure above TSP =PRQ, QR = 8cm. PR = 6cm and ST = 12cm. Find the length SP

A. 4cm B. 16cm C. 9cm

D. 14cm E. Impossible insufficient data

### Y Z

48. Measurements of the diameters in centimeters of 20 copper spheres are distributed as shown below



**5 cm**

**4 cm**

**10 cm**

Class boundary in cm frequency 3.35-3.45 3

3.45-3.55 6

3.55-3.65 7

3.65-3.75 4

What is the mean diameter of the copper sphere?

A. 3.40cm B. 3.58cm C. 3.56cm

D. 3.62cm E. 3.63cm

Use the instruction below to answer question49 and 50 49. What is the obtuse angle formed when the point U is

joined to Q?



**T**

**U**

**O**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 750 | B. | 1540 | C. | 1200 |
| D. | 1050 | E. | 1250 |  |  |

1. What is the acute angle formed when the point V joined to Q?

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **V** | **R** | **S** | A. | 600 | B. | 300 | C. | 450 |
|  |  |  | D. | 900 | E. | 150 |  |  |

**P**

# Mathematics 1985

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1. | Arrange the following numbers in ascending order of | A. | 3/2 B. | 2/3 | C. | 2 |
|  | magnitude 6/7,13/15,0.865 | D. | 3 E. | 18 |  |  |

1. 6/7 < 0.865 < 13/15
2. 6/7 < 13/15 < 0.865
3. 13/15 < 6/7 < 0.865
4. 13/15 < 0.865 < 6/7
5. 0.865 < 6/7 < 13/15

2. A sum of money was invested at 8% per annum simple interest. If after 4years the money amounts to #330.00, find the amount originally invested.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A.  D. | #180.00  #200.00 | B.  E. | #165.00  #250.00 | | C. | #150.00 |  | A.  D. | #45.00 B.  #58.00 E. | | #48.00 C.  #60.00 | | #52.00 |
| 3. I | the equation below, solve for x if all the numbers are in base 2? 11/x= 1000/(x+ 101) | | | | | | | 10. | Find x if Log9x = 1.5  A. 72.0 B. | | |  |  |  |
|  |  | 27.0 | C. | 36.0 |
|  | A. | 101 | B. | 11 | C. | 110 | |  | D. | 3.5 | E. | 24.5 |  |  |
|  | D. | 111 | E. | 10 |  |  | |  |  |  |  |  |  |  |

1. Without using tables, evaluate Log24 + Log42 – Log255

##### ½ B. 1/5 C.0

D. 5 E. 2

1. John gives one third of his money to Janet who has #105.00. He then finds that his money is reduced to one-fourth of what Janet now has. Find how much money John hadat first.
2. List all integers satisfying the inequality

-2 < 2x – 6 < 4

11. Write h in terms of a =b(1 - ch)

(1-dh)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A. | 2,3,4,5 B. | 2,3,4 C. | 2,5 | A | h = (a - b) | B. h = (a + b ) |
| D. | 3,4,5 E. | 4,5 |  |  | (ad- bc) | (ad - bc) |

1. Find correct to tow decimal places

100 + 1/100 + 3/1000 + 27/10000

##### 100.02 B. 1000.02

1. h = (ad - bc) D. h = (1 - b)

( a - b ) (d - bc)

1. 100.22 D. 100.01 E. h = (b - a)

E. 100.51 (ad - bc)

1. Simplify 1/2 + 1 12. 221/ % of the Nigerian Naira is equal to 171/ % of a foreign

2 10

1 currency M. what is the conversion rate of the M to the

57

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 2 + ------------- |  |  | Naira? |  | | |
| 1 |  |  | A. | 1M = 15/ N | B. | 1M = 211/ N  57 |
| 2 - -------------- |  |  | C. | 1M = 118/ N | D. | 1M = 381/ N  4 |
| 4 +1/5 |  |  | E. | 1M = 3843/ N |  |  |
| A. | ¾ B. | –1/3 C. | 169/190 |  |  |  |  |

57

4

169

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| D. | 13/15 | E. | 121/ | 13. | Find the values of p for which the equation x2 – (p - 2)x |
|  |  |  |  |  |  |
|  |  |  |  |  | + 2p + 1 = 0 has equal roots |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 7. | If three number p,q,r are in the ratio 6:4:5 find the value | A. | (0,12) | B. | (1,2) C. | (21,0) |
|  | of (3q – q)/(4q + r) | D. | (4,5) | E. | (3,4) |  |

1. If ex = 1 + x + x2/12 + x3/1.2.3 + ….. find 1/e1/2
   * 1. - x + x2 - x2 +... B. 1 + x + x2 + x2

2 123 24 3 2 1.22 23.3

C. 1 + x + x2 - x2 +... D. 1 - x + x2 - x2 +

2 1.23 24. 3 2 1.22 23.3

E. 1+ x 3 + x3 - x4 +

1.2 12.4 12.63

1. (43 + 42) (43 - 42) (3 + 2) is equal to

|  |  |  |  |
| --- | --- | --- | --- |
| A.  C. | 0 B. 43 + 42 (42 - 43) (3 + 2) |  |  |
| D. | 3 + 2 | E. | 1 |

1. In a restaurant, the cost of providing a particular type of food is partly constant and partly inversely proportional to the number of people. If the cost per head for 100people is 30k and the cost for 40 people is 60k, find the cost for 50people

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 15k | B. | 45k | C. | 20k |
| D. | 50k | E. | 40k |  |  |

1. The factors of 9 – (x2 – 3x - 1)2 are
   1. -(x - 4)(x + 1)(x- 1)(x - 2)
   2. (x - 4)(x- 1)(x - 1)(x + 2)
   3. -(x - 2)(x + 1)(x+ 2)(x + 4)
   4. (x - 4)(x -3)(x- 2)(x + 1)
   5. (x - 2)(x + 2)(x- 1)(x + 1)
2. If 32y – 6(3y) = 27 find y

##### 3 B. –1 C. 2

1. –3 E. 1
2. Factorize abx2 + 8y – 4bx –2axy

|  |  |  |
| --- | --- | --- |
| A. | (ax - 4) (bx – 2y) B. | (ax + b) (x – 8y) |
| C. | (ax – 2y) (by– 4) D. | (abx - 4) (x – 2y) |
| E. | (bx - 4) (ax – 2y) |  |

1. At what real value of x do the curves whose equations are y = x3 + x and y = x2 + 1 intersect?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | -2 | B. | 2 | C. | –1 |
| D. | 0 | E. | 1 |  |  |

1. If the quadrilateral function 3x2 – 7x + R is a perfect square find R

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 49/24 | B. | 49/3 | C. | 49/6 |
| D. | 49/12 | E. | 49/36 |  |  |

1. Solve the following equation 2/(2r – 1) – 5/3 = 1/ (r + 2)

|  |  |  |  |
| --- | --- | --- | --- |
| A. | (-1, 5/2) | B. | (-1, -5/2) |
| C. | (5/2, 1) | D. | (2, 1) |
| E. | (1, 2) |  |  |

|  |  |  |
| --- | --- | --- |
| 23. | Solve for (x,y) in the equations |  |
|  | 2x + y = 4: x2 + xy = -12 |  |
|  | A. (6, -8); (-2,8) B. | (3, -4); (-1, 4) |
|  | C. (8, -4); (-1, 4) D. | (-8, 6);(8, -2) |
|  | E. (-4, 3);(4,-1) |  |

1. Solve the simultaneous equations 2x – 3y + 10 = 10x – 6y = 5
   1. x = 21/ , y = 31/ B. x = 31/ , y = 21/
2. If f(x - 2) = 4x2 + x + 7 find f(1)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A. | 12 B. | 27 | C. | 7 |
| D. | 46 E. | 17 |  |  |

1. In DXYZ, XY = 13cm, YZ = 9cm, XZ= 11cm and XYZ=

q0. find cos q0

* 1. 4/39
  2. 43/39
  3. 209/286
  4. 1/6
  5. 43/78

1. Find the missing value in the table below

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **x -2** | **-1** | **0** | **1** | **2** | **3** |
| **y = x2O - x + 3** | **3** | **3** | **3** | **9** | **27** |

##### -32 B. –14 C. 40

1. 22 E. 37
2. Find the number of goals scored by a football team in 20matches is shown below

**No . of goals 0 1 2 3 4 5**

**No . of matches 3 5 7 4 1 0**

What are the values of the mean and the mode respectively?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | (1.75, 5) | B. | (1.75, 2) |
| C. | (1.75, 1) | D. | (2,2) |
| E. | (2,1) |  |  |

1. If the hypotenuse of a right angle isosceles triangle is 2, what is the length of each of the other sides?

##### 2 B. 1/2 C. 22

D. 1 E. -1



2

1. If two fair coins are tossed, what is the probability of getting at least one head?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | ¼ | B. | ½ | C. | 1 |
| D. | 2/3 | E. | ¾ |  |  |

1. The ratio of the length of two similar rectangular blocks is 2:3, if the volume of the larger block is 351cm3, then the volume of the other block is

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 234.00cm3 | B. | 526.50cm3 |
| C. | 166.00cm3 | D. | 729.75cm3 |
| E. | 104.00cm3 |  |  |

1. The bearing of bird on a tree from a hunter on the ground is N720E. what is the bearing of the hunter from the bird?

##### S180W B. S720W

C. S720Eq D. S270E

##### E. S270W

C. x = 21/2, y = 3 3 D. x = 31/2 , y =21/3

1. x = 21/4 , y = 21/ 2 5

2 3

1. **X** 39. A solid sphere of radius 4cm has mass of 64kg. What will be the mass of a shell of the same metal whose internal and external radii are 2cm and 3cm respectively?



**25**

**15**

**8**

**K**

* 1. 5kg B. 16kg C. 19kg

D. 25kg E. 48kg

**Y Z**

1. **S**



**145O**

**R**

**O**

In D XYZ above, XKZ = 900, XK = 15cm, XZ cm and YK

= 8cm. Find the area of the D XYZ.

A. 180sq.cm B. 210sq.cm

C. 160sq.cm D. 320sq.cm **P Q**

E. 390sq.cm

1. Without using tables. Calculate the value of 1 + sec230?

##### 21/ B. 2 C. 11/

3 3

##### D. ¾ E. 3/7

1. What is the probability that a number chosen at random

In the figure above POQ is the diameter of the circle PQRS. If PSR = 1450, find x0

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| from the integers between 1 and 10 inclusive is either a | A. | 250 | B. | 350 | C. | 450 |
| prime or a multiple of 3? | D. | 550 | E. | 250 |  |  |

##### 7/10 B. 3/5 C. 4/5

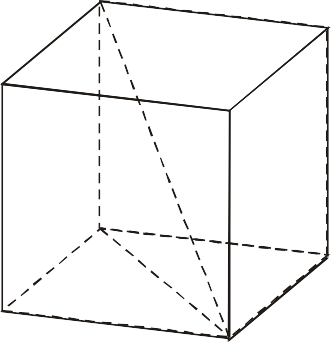
D. ½ E. 3/10

1. Find the area of a regular hexagon inscribed in a circle of radius 8cm.
   1. 163cm2 B. 963cm2
2. 192.3cm2 D. 16cm2

E. 32cm2

1. **N**

**M**



**L**

**J**

**K**

**I**

1. **X**

**G**



**N**

**86O**

**122O**

**Q**

**P**

**H**

In the figure above GHIJKLMN is a cube of side a. find the length of HN

* 1. 3a B. 3a C. 3a2

1. a2 E. a3

**M**

1. PQRS is a trapezium of area 14cm2 in which PQ//RS, if PQ = 4cm and SR = 3cm, find the area of DSQR in cm2

##### 7.0 B. 6.0 C. 5.2

D. 5.0 E. 4.1

**Y**

In the figure above, MNOP is a cyclic quadrilateral, MN and PQ are produced to meet at X and NQ and MP are produced to meet at Y. if MNQ = 860 and NQP= 1220, find (x0,y0)

|  |  |  |  |
| --- | --- | --- | --- |
| A. | (280,,360) | B. | (360 ,280) |
| C. | (430,,610) | D. | (610 ,430) |
| E. | (360 ,430) |  |  |

1. If cosq = 3/2 and 0 is less than 900, calculate

cot (90 - q) / sin2q

* 1. 43/3 B. 43

1. 3/2 D. 1/3

E. 2/3

**S P**



**Q**

**0O**

**0O**

**R**

In the figure PQ is the tangent from P to the circle QRS with SR as its diameter. If PQR= q0, which of thefollowing relationship 00 is correct.?

A. q0 + f = 900 B. f0 = 900 - 200

C. q0 = f0 D. f0 = 200

E. q0 + 2f0 = 1200

1. A bag contains 4 white balls and 6 red balls. Two Redballs are taken from the bag without replacement. What is the probability that they are both red?

##### 1/3 B. 2/9 C. 2/15

48. In a class of 120students, 18 of them scored an A grade in Mathematics. If the section representing the A grade students on a pie chart has angle Z0 at the centre of the circle, what is Z?

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| D. | 1/5 | E. | 3/5 | A. | 15 | B. | 28 | C. | 50 |
|  |  |  |  | D. | 52 | E. | 54 |  |  |

1. How many 2 2cm diameter discs can be cut out of a sheet of cardboard 218 2p3/4cm long and p1/2cm wide?
   1. 49 B. 219 C. 217p3/4( 2p + 2)

D. 210p3/4(1 +2) E.

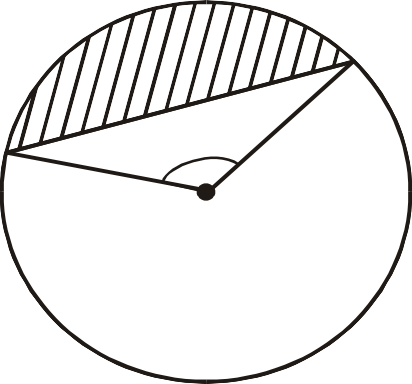


29( 2 + 1)

1. Two points X and Y both on latitude 600S have longitudes 1470E and 1530W respectively. Find to the nearest kilometre the distance between X and Y measured along the parallel of latitudes (Take 2 R = 4 x 104km, where R is the radius of the earth).
   1. 28.850km B. 16.667km

C. 8.333km D. 6.667km

E. 3.333km



**120O**

**3**

**3**

In the figure above the area of the shaded segment is

49.

In the figure above find the angle x



**80O**

**40O**

**20O**

***x*O**

##### A. 1000 B. 1200 C. 600

1. 1100 E. 1400

50. If a (x+1) - (x +1) = bx

( x-2 ) ( n+2)

Find a simplest form

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | x2 – 1 | B. | x2 + 1 | C. | x2 + 4 |
| D. | 1 | E. | x2 - 4 |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A. | 3p | B. | 9 3/4 |  |
| C. | 3(p - 3 | 3/4) | D. | 3( 3 - p)/4 |
| E. | p + 9 | 3/4 |  |  |

# Mathematics 1986

1. Evaluate

(212)3 – (121)3 + (222)3

##### (313)3 B. (1000)3

1. Find the reciprocal of 2/3

1/2 + 1/3

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C. | (1020)3 | D. | (1222)3 | A. | 4/5 | B. | 5/4 |
|  |  |  |  | C. | 2/5 | D. | 6/7 |

1. If Musa scored 75 in Biology instead of 57, his average mark in four subjects would have been 60. what was his total mark?

##### 282 B. 240

C. 222 D. 210

1. Three boys shared some oranges. The first receive 1/3 of the oranges, the second received 2/3 of the remainder, if the third boy received the remaining 12 oranges. How many oranges did they share?

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | A. | 60 | B. | 54 |
| 3. Divide the L.C.M. of 48, 64 and 80 by their H.C.F | | | |  | C. | 48 | D. | 42 |
| A. 20 B. 30 | | | | | | | | |
| C. 48 D. 60 | | | | 7. | If P = 18, | Q = 21, R = -6 | and S = -4 | calculate (P - Q) + S2 |
|  | | | |  | A. | -11/216 | B. | 11/216 |
| 4. Find the smallest number by which 252 can be | | | |  | C. | –43/115 | D. | 41/116 |
| multiplied to obtain a perfect square | | | |  |  |  |  |  |
| A. | 2 | B. | 3 |  |  |  |  |  |
| C. | 5 | D. | 7 |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8. | Simplify 0.03 x 4 x 0.00064 | | 20. | | | Factorize x2 + 2a + ax + 2x | |  | |
|  | 0.48 x 0.012 | |  | | | A. (x + 2a)(x + 1) | | B. | (x + 2a)(x - 1) |
| A.  C. | | 3.6 x 102  3.6 x 103 | B.  D. | 36 x 102  3.6 x104 | C. | | (x2 - 1)(x + a) | D. | (x + 2)(x + a) |

1. Udoh deposited #150 00 in the bank. At the end of 5 years the simple interest on the principal was #55 00. At what rate per annum was the interest paid?
2. Solve the equation 3x2 + 6x – 2 = 0
   1. x = -1,3/3 B. x = -1,15/3

C. x =-2, 23/3 D. x = -2, 215/3

2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 11% | B. | 71/ %  3 | 22. | Simplify. 1/ 5x +5 | + 1/7x + 7 |  |
| C. | 5% | D. | 31/ % |  | A. 12/35+7 | B. | 1/35(x+1) |

1. A number of pencils were shared out among Bisi, Sola and Tunde in the ratio 2:3:5 respectively. If Bisi got 5, how many were shared out?

##### 15 B. 25

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C. | 30 | D. | 50 | A. | (4,0)(0,0)(-1,0) | B. | (-4,0)(0,4)(1,1) |
|  |  |  |  | C. | (0,0)(0,1)(1,0) | D. | (0,4)(4,0)(-1,0) |

C. 12x/35(x+1) D. 12/35x +35

1. The curve y = -x2 + 3x + 4 intersects the coordinate axes at
2. The ages of Tosan and Isa differ by 6 and the product of their ages is 187. write their ages in the form (x, y), where x >y

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | (12, 9) | B. | (23, 17) | C. | (a + 5)(7a + 1) | D. | a(7a + 1) |
| C. | (17, 11) | D. | (18, 12) |  |  |  |  |

1. Factorize (4a + 3)2 – (3a - 2)2
   1. (a + 1)(a+ 5) B. (a - 5)(7a - 1)
2. In 1984, Ike was 24 years old and is father was 45 years old in what year was Ike exactly half his father’s age?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 1982 | B. | 1981 |  |  |
| C. | 1979 | D. | 1978 | 26. | Simplify 1/ x - 2 + 1/ x + 2 + 2x / x2 - 4 |

1. If 5(x + 2y) = 5 and 4(x + 3y) = 16, find 3(x +y)

##### 0 B. 1

C. 3 D. 27

1. Simplify ( 1 1 ) x -1/

      

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3/5 | B. | –2/3 |
| C. | –2 | D. | –1 |

1. Find n if Log 4 + Log Z – Log n = -1
   1. 2x/ (x-2) (x+2) (x2 - 4) B.2x/x2 - 4

C. x/x2- 4 D. 4x/ x2 - 4

1. Make r the subject of the formula S = 6/v - w/2
   1. V = 6 = 12 B. v = 12
      1. 10 2

2 B. 2

14 S2 w 252 - w

C. v = 12 - 2s2 D. v = 12

##### C. 27 D. 28

1. (91/3 x 27-1/2) / (3-1/6 x 3-2/3)

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1/3 | B. | 1 |
| C. | 3 | D. | 9 |

1. If x varies directly as y3 and x = 2 when y = 1, find x when y = 5

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 2 | B. | 10 |
| C. | 125 | D. | 250 |

1. Factorize completely.

3a + 125ax3

* 1. (2a+ 5x2)(4 + 25ax)
  2. a(2 + 5x)(4 – 10x + 25ax2)
  3. (2a + 5x)(4 - 10ax + 25ax2)
  4. a(2 + 5x)(4 + 10ax + 25ax2)

1. If y = x/(x – 3) + x/(x + 4) find y when x = -2

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -3/5 | B. | 3/5 |
| C. | –7/5 | D. | 7/5 |

1. Find all the numbers x which satisfy the inequality 1/ 3(x + 1) – 1 > 1/5 (x + 4)
   1. x< 11 B. x< -1

C. x> 6 D. x> 11

w 2s2 + w

1. Find the values of x which satisfy theequation

16x – 5x 4x + 4 = 0

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1 and 4 | B. | –2 and 2 |
| C. | 0 and 1 | D. | 1 and 0 |

1. a/b –c/d = k, find the value of

(3a2 – ac + c2)/(3b2 – bd + d2) in term of k

* 1. 3k2 B. 3k –k2

C. 17k2/4 D. k2

1. At what point does the straight line y = 2x + 1 intersect the curve y = 2x2 + 5x – 1?
   1. (-2,-3) and(1/2, 2) B. (-1/2 0) and (2, 5)

C. (1/2, 2) and(1, 3) D. (1, 3) and (2, 5)

1. A regular polygon on n sides has 1600 as the size each interior. Find n.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 18 | B. | 16 |
| C. | 14 | D. | 12 |

1. If cos q = a/b, find 1 +tan2q
   1. b2/a2 B. a2/b2

C. (a2 + b2) / (b2 – a2) D. (2a2 + b2)/ (a2 + b2)

1. In the diagram below, PQ and RS are chords of a circle centre O which meet at T outside the circle. If TP = 24cm, TQ = 8cm and TS = 12cm, find TR.
2. An arc of circle of radius 6cm is 8cm long. Find the area of the sector.
   1. 51/ cm2 B. 24cm2

3

C. 36cm2 D. 48cm2

1. **X**

**4**

**3**

**P**

**Q**

**T**

**O**

**R**

**S**

A. 16cm B. 14cm

C. 12cm D. 8cm **Y Z 6**

1. The angle of elevation of the top of a vertical tower 50 metres high from a point X on the ground is 300. From a point Y on the opposite side of the tower, the angle of elevation of the top of the tower is 600. find the distance

between the points X and Y. 40.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 14.43m | B. | 57.73m |
| C. | 101.03m | D. | 115.47m |

In XYZ above, determine the cosine of angle Z

##### A. ¾ B. 29/36

C. 2/3 D. ½

**T**



**S**

1. A girl walk 45 metres in the direction 0500 from a point Q to a point X. She then walks 24metres in the direction 1400 from X to a point Y. How far is she then from Q?

**20O**

**Q**

**35O**

**R**

* 1. 69m B. 57m

C. 51m D. 21m

In the figure above PQT is isosceles. PQ = QT. SRQ

= 350, TQ = 200 and PQR is a straight line. Calculate TSR.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 36. | A. | 200 | B. | 550 |
|  | C. | 75 | D. | 1400 |

**6 m**

**8 m Q**

**11 m**

**R**



**P**

**12 m**

1. Find the total surface are of a solid cone of radius 2 3cm and slanting side 43cm
   1. 83cm2 B. 24cm2

C. 153cm2 D. 36cm2

1. If U and V are two distinct fixed points and W is a variable point such that UWV is a straight angle. What is the locus of W?
   1. The perpendicular bisector of UV

37.

The figure is a solid with the trapezium PQRS as its uniform cross-section. Find its volume

1. 102m3 B. 576m3

C. 816m3 D. 1056m3

1. A circle with UV as radius
2. A line parallel to the line UV
3. A circle with the line UV as the diameter

**TP**



**65O**

**35O**



**Q**

**O x**

**R**

PQ and PR are tangents from P to a circle centre O as shown in the figure above. If QRP = 340. Find the angle marked x.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 340 |  | B. | 560 | In the figure above, PQ//ST, RS//UV. If PQR = 350 and | | | |
| C. | 680 | D. | 1120 |  | QRS = 650, find STV | |  |  |
|  |  |  |  |  | A. | 300 | B. | 350 |
|  |  |  |  |  | C. | 550 | D. | 650 |

1. An open rectangular box externally measures 4m x 3m x 4m. find the total cost of painting the box externally if it costs #2.00 to paint onesquare metre.

##### #96.00 B. #112.00

C. #136.00 D. #160.00

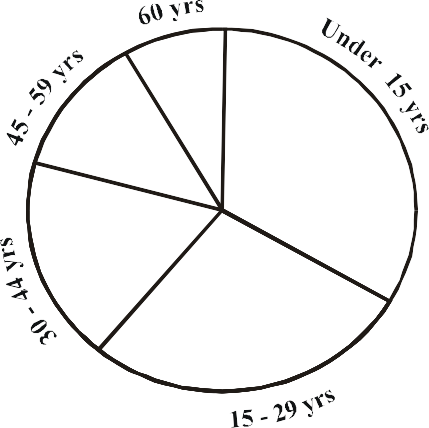
1. Of the nine hundred students admitted in a university in 1979, the following was the distribution by state

|  |  |
| --- | --- |
| Anambra | 185 |
| Imo | 135 |
| Kaduna | 90 |
| Kwara | 110 |
| Ondo | 155 |
| Oyo | 225 |

In a pie chart drawn to represent this distribution, the angle subtended at the centre by Anambra is

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A. | 500 | B. | 650 |  |  |  |  |
|  | C. | 740 | D. | 880 |  |  |  |  |
|  |  |  |  |  | A. | 29 x 104 | B. | 26 x 104 |
| 46. | Find the median of the numbers 89, 141, 130, 161, 120, | | | | C. | 16 x 104 | D. | 13 x 104 |
|  | 131, 131, 100, 108 and 119 | | |  |  | | | |
|  | A. | 131 | B. | 125 | 49. A man kept 6black, 5 brown and 7 purple shirts in a | | | |
|  | C. | 123 | D. | 120 | drawer. What is the probability of his picking a purple | | | |
| shirt with his eyes closed? | | | | | | | | |
| 47. Find | | the probability that a | number | selected at random | A. 1/7 B. 11/18 | | | |
|  | from | 40 to 50 is a prime |  |  | C. 7/18 D. 7/11 | | | |
|  | A. | 3/11 | B. | 5/11 |  |  |  |  |
|  | C. | 3/10 | D. | 4/11 | 50. The table below gives the scores of a group of students | | | |
|  |  |  |  |  | in a Mathematics test | |  |  |

1. The people in a city with a population of 109 million were grouped according to their ages. Use the diagram below to determine the number of people in the 15-29 years group.



**24O**

**52O**

**116O**

**64O**

**104O**



If the mode is m and the number of students who scored 4 or less is S. What is (s, m)?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | (27,4 ) | B. | (14, 4) |
| C. | (13, 4) | D. | (4, 4) |

# Mathematics 1987

1. Convert 241 in base 5 to base 8

##### 718 B. 1078

C. 1768 D. 2418

1. Find the least length of a rod which can be cut into exactly equal strips, each of either 40cm or 48cm in length.
   1. 120cm B. 240ccm

C. 360cm D. 480cm

1. A rectangular has lawn has an area of 1815square yards. If its length is 50meters, find its width in metres. Given that 1meters equals 1.1yards

##### 39.93 B. 35.00

C. 33.00 D. 30.00

1. Reduce each number to two significant figures and then evaluate (0.02174 x 1.2047)

0.023789

##### 0.8 B. 0.9

C. 1.1 D. 1.2

1. A train moves from P to Q at an average speed of 90km/ hr and immediately returns from O to P through the same route and at an average speed of 45km/h. find the average speed for the centre journey.
   1. 55 00km/hr B. 60 00km/hr

C. 67.50km/hr D. 75 00km/hr

1. If the length of a square is increased by 20% while its width is decreased by 20% to form a rectangle, what is the ratio of the area of the rectangle to the area of the square?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 6.5 | B. | 25.24 |
| C. | 5.6 | D. | 24.25 |

1. Two brothers invested a total of #5,000.00 on a farm project. The farm yield was sold for # 15, 000.00 at the end of the season. If the profit was shared in the ratio 2:3, what is the difference in the amount of profit received by the brothers?

##### #2,000.00 B. #4,000.00

C. #6,000.00 D. #10,000.00

1. Peter’s weekly wages are #20.00 for the first 20 weeks and #36.00 for the next 24 weeks. Find his average weekly wage for the remaining 8 weeks of the year. If his average weekly wage for the whole year is #30.00

##### #37.00 B. #35.00

C. #30.00 D. #5.00

1. The formula Q = 15 + 0 5n gives the cost Q (in Naira) of feeding n people for a week. Find in kobo the extra cost of feeding one additional person.
   1. 350k B. 200k

C. 150k D. 50k

1. If P varies inversely as V and V varies directly as R2, find the relationship between P and R given that R = 7 when P = 2

##### P = 98R2 B. PR2 = 98

C. P = 1/98R D. P = R2/98

1. Make y the subject of the formula Z = x2 + 1/y3

|  |  |  |
| --- | --- | --- |
| 9. A man invests a sum of money at 4% per annum simple | A. y = 1  (z - x2) 3 | B. y= 1  (Z + x3) 1/  3 |
| interest. After 3 years, the principal amounts to #7,000.00. find the sum invested | C. y= 1 | D. y = 1 |

|  |  |  |  |
| --- | --- | --- | --- |
| A. | #7,840.00 | B. | #6,250.00 |
| C. | #6,160.00 | D. | #5,833.33 |

1. By selling 20 oranges for #1.35 a trader makes a profit 8%. What is his percentage gain or loss if he sells the same 20oranges for #1.10?

(Z - x2) 1/ 3  3 x2

1. Find the values of m which make the following quadratic function a perfect square

3

x2 + 2 (m + 1) x + m + 3

##### -1, 1 B. –1, 2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 8% | B. | 10% | C. | 1, -2 | D. | 2, -2 |
| C. | 12% | D. | 15% |  |  |  |  |

1. Four boys and ten girls can cut a field in 5 hours. If the boys work at 1/4 the rate of which the girls work, how many boys will be needed to cut the field in 3 hours?

##### 180 B. 60

C. 25 D. 20

1. Evaluate without using tables.
2. Factorize 62x+ 1 + 7(6x) - 5
   1. {3(6x) – 5} {2(6x)} + 1}
   2. {3(6x) – 5} {2(6x)} - 1}
   3. {2(6x) – 5} {3(6x)} + 1}
   4. {2(6x) – 5} {3(6x)} - 1}
3. Find two values of y which satisfy the simultaneous equations x + y = 5, x2 – 2y2 = 1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 625/8 | B. | 8/625 | A. | 12, -2 | B. | –12, 12 |
| C. | 1/8 | D. | 8 | C. | –12, 2 | D. | 2, -2 |

1. Instead of writing 35/6 as a decimal correct to 3 significant figures, a student wrote it correct to 3 places of decimals. Find his error in standard form

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 0.003 | B. | 3.0 x 10-3 |
| C. | 0.3 x 102 | D. | 0.3 x 10-3 |

1. Simplifywithout using tables

(Log26 – Log23)/(Log28- 2Log21/2)

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1/5 | B. | ½ |
| C. | –1/2 | D. | Log23/Log27 |

1. Simplify without using tables 2 14 x 321) / 724x 298)

##### A. 3 B. 3

4 4

##### C. 3 14 D. 3 2

28 28

1. If p – 2/3 (1 – r2)/n2, find n when r = Ö1/3 and p = 1

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3/2 | B. | 3 |
| C. | 1/3 | D. | 2/3 |

1. If a =U2–3V2 and b = 2UV + V2 evaluate (2a - b) (a – b3 ), when u = 1 and v = -1

##### 9 B. 15

C. 27 D. 33

1. An (n - 2)2 sided figure has n diagonals find the number n ofdiagonals for a 25 sided figure

##### 7 B. 8

C. 9 D. 10



***f(x)***

**-1**

**0**

**1**

A cubic function f(x) is specified by the graph show above. The values of the independent variable for which the function vanishes are

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -1, 0, 1 | B. | –1 < x < 1 |
| C. | x, - 1 | D. | x > 1 |

1. Solve the inequality x – 1 > 4(x + 2)
   1. x> -3 B. x< -3

C. 2 < x < 3 D. –3 < x < -2

1. Simplify(x2 - y2) / (2x2 + xy-y2)
   1. x + - y B. x +y

|  |  |  |  |
| --- | --- | --- | --- |
| 2x  C. x - y 2x - y | + y | 2x - y  x - y  2x + y | |
| D. |
| The minimum value of y in the equation y = x2 – 6x + 8 is | | | |
| A. | 8 | B. | 3 |
| C. | 0 | D. | –1 |

1. Find the sum of the first 21 terms of the progression – 10, -8,-6,….

**Y**

**X Z**



**9 cm**

**16 cm**

**T**

In the figure above, XYZ = YTZ = 900, XT = 9cm and TZ = 16cm. Find YZ

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 180 | B. | 190 | A. | 25cm | B. | 20cm |
| C. | 200 | D. | 210 | C. | 16cm | D. | 9cm |

1. Find the eleventh term of the progression 4, 8, 16,..

##### 213 B. 212

##### C. 211 D. 210

1. **Q**



***x***

**O**

**R**

**30O**

**P**

1. Two chords QR and NP of a circle intersect inside the circle at X. if RQP = 370, RQN = 490 and QPN = 350, find PRQ

##### A. 350 B. 370

##### C. 490 D. 590



***y y***

***x***

***x***

***x***

**T**

In the diagram above, POQ is a diameter, O is the centre of the circle and TP is a tangent. Find the value of x.

A. B. 400 In the figure above, find the value of x.

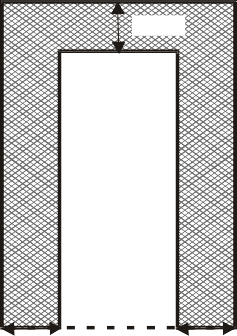
|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C. | 450 | D. | 500 | A. | 1100 | B. | 1000 |
|  |  |  |  | C. | 900 | D. | 800 |

1. **Q 2*h* R**

**3*h***

**Q**

**R**



**2 cm**

**2 cm**

**2 cm**

**P**

**T S**

In the diagram above, QR//TS, QR:TS = 2:3. find the ratio of the area of triangle PQR to the area of the trapezium QRST

##### A. 4:9 B. 4:5

C. 1:3 D. 2:3

1. Three angle s of a nonagon are equal and the sum of six other angles is 11100. Calculate the size of one of the equal triangles

**P S**

In the figure above, PQRS is a rectangle. If the shaded area is 72sq.cm find h

A. 12cm B. 10cm

C. 8cm D. 5cm

1. The sine, cosine and tangent of 2100 are respectively

##### A. -1/2, 3/2, 3/3 B. 1/2, 3/2 3/3

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 2100 | B. | 1500 | C. | 3/2, 3/3, | 1 | D. 3/2, 1/2 1 |
| C. | 1050 | D. | 500 |  |  |  |  |

1. If tan q = (m2 – n2)/2mn, find sec q

A. (m2 + n2)/(m2 – n2) B. (m2+n2)/2mn

C. mn/2(m2–n2) D. m2 n2/(m2 – n2)

1. From two points X and Y, 8m apart, and in line with a pole, the angle of elevation of the top of the pole are 300 and 600 respectively. Find the height of the pole, assuming that X, Y and the foot of the pole are on the same horizontal plane.

A. 4m B. 83/2m

C. 43m D. 83m

1. A room is 12m long. 9m wide and 8m high. Find the cosine of the angle which a diagonal of the room makes with the floor of theroom

##### A. 15/17 B. 8/17

C. 8/15 D. 12/17

1. What is the circumference of radius of the earth?

A. R cos q B. 2p R cos q

C. R sin q D. 2p R sin q

1. The base of a pyramid is a square of side 8cm. If its vertex is directly above the centre, find the height, given that the edge is 4.3cm

A. 6cm B. 5cm

C. 4cm D. 3cm

### P



**Q**

**R**

**X**

1. What is the locus of the mid-points of all chords of length 6cm within a circle of radius 5cm and with centre O.
2. A circle of radius 4cm and with centre O
3. The perpendicular bisector of the chords
4. A straight line passing through center O
5. A circle of radius 6cm and with centre O
6. Taking the period of daylight on a certain day to be from 5.30a.m to 7.00p.m, calculate the period of daylight and of darkness on that day

##### A. 187030’172030’ B. 1350225’

C. 202030’157030’ D. 1950165’

1. The goals scored by 40 football teams from three league divisions are recorded below

What is the total number of goals scored by all the teams?



##### A. 21 B. 40

C. 91 D. 96

1. The numbers 3,2,8,5,7,12,9 and 14 are the marks scored by a group by a group of students in a class test if P is the mean and Q the median the P + Q is

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 18 | B. | 171/  2 |
| C. | 16 | D. | 15 |

1. Below are the scores of a group of students in a music test



If CF(x) is the number of students with scores less than or equal to x, find CF(6)

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 40 | B. | 38 |
| C. | 33 | D. | 5 |

1. Find the probability of selecting a figure which is parallelogram from a square, a rectangle, a rhombus, a kite and a trapezium

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| The figure above is an example of the construction of a | A. | 3/5 | B. | 2/5 |
| A. perpendicular bisector to a given straight line | C. | 4/5 | D. | 1/5 |
| B. perpendicularfrom a givenpointtoa givenline |  |  |  |  |
| C. perpendicular to a line from a given point on |  |  |  |  |
| that line |  |  |  |  |
| D. given angle. |  |  |  |  |

# Mathematics 1988

1. Simplify (1 1 / (2 1 of32)

2 4

##### 3/256 B. 3/32

C. 6 D. 85

1. If x is the addition of the prime numbers between 1 and 6, and y the H. C.F of 6,9, 15, find the product of x and y

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 27 | B. | 30 |
| C. | 33 | D. | 90 |

1. A 5.0g of salts was weighed by Tunde as 5.1g. what is the percentage error?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 20 | B. | 2 |
| C. | 2 | D. | 0.2 |

1. Find correct to one decimal place, 0.24633 /0.0306

##### 0.8 B. 1.8

C. 8.0 D. 8.1

1. Two sisters, Taiwo and Kehinde, own a store. The ratio of Taiwo’s share to Kehind’s is 11:9. later Kehinde sells 2/3 of her share to Taiwo for #720.00. Find the value of the store.

##### #1,080.00 B. #2,400.00

C. #3,000.00 D. #3,600.00

1. A basket contains green, black and blue balls in the ratio 5:2:1. if there are 10 blue balls, find the corresponding new ratio when 10green and 10black balls are removed from the basket.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1:1;1 | B. | 4:2:1 |
| C. | 5:1:1 | D. | 4:1:1 |

1. A taxpayer is allowed 1/8th of his income tax free, and pays 20% on the remainder. If he pays #490. 00 tax, what is hisincome?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | #560.00 | B. | #2,450.00 |
| C. | #2,800.00 | D. | #3,920.00 |

1. Evaluate (8 1/3 x 5 2/3) / 102/3

##### 2/5 B. 5/3

C. 25 D. 35

1. If Log102 = 0.3010 and Log103 = 0.4771, evaluate, without using logarithm tableslog104.5

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| B. | 0.4771 | A. | -1,0,1,2 | B. | 0,1,2,3 |
| D. | 0.9542 | C. | -1,0,1,2,3, | D. | -1,0,2,3 |

* 1. 0.3010

##### C. 0.6352

1. Find m such that (m ¸ 3) (1 - 3 )2 = 6 - 3 = 6 - 23

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1 | B. | 2 |
| C. | 3 | D. | 4 |

1. The thickness of an 800-paged book is 18mm. Calculate the thickness of one leaf of the book giving your answer in metres and in standard form.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 2.25x 10-4m | B. | 4.50 x 10-4m |
| C. | 2.25x 10-5m | D. | 4.50x 10-5m |

1. Simplify ( x + 2) - (x - 2)

( x + 1) ( x +2)

* 1. 3 B. 3x + 2

x + 1 (x+1) (x+2)

C. 5x+ 6 D. 2x2 + 5x + 2 (x + 1) (x + 2) (x + 1) (x + 2)

1. If 1/p = (a2 + 2ab + b2)

(a - b) and 1/q = (a + b)

(a2 - 2ab + b2) find p/q

* 1. a + b B. 1

a - b a2 - b2

C. a - b D. a2 - b2 a + b

1. If x varies inversely as the cube root of y and x = 1 when y = 8 find y when x = 3

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1/3 | B. | 2/3 |
| C. | 8/27 | D. | 4/9 |

1. If a = -3, b = 2, c = 4, calculate (a3-b3-c1/2)

(b-1-c)

–37/5

|  |  |  |
| --- | --- | --- |
| A. | 37 | B. |
| C. | 37/5 | D. |

–37

1. If g(y) = y – 3/11 + 11/ y2 – 9 what is g(y + 3)?
   1. y + 11 B. y + 11

|  |  |  |  |
| --- | --- | --- | --- |
| 11 | y(y+6) |  | 11 y(y+3) |
| C. y + 30 | + 11 | D. | y + 3 + 11 |
| 11 | y(y+3) |  | 11 y(y-6) |

1. Factorize completely (x2 + x) 2 (2x + 2)2
   1. (x+y)(x+2)(x-2) B. (x+ y)2(x-2)2

C. (x+1)2(x+2)2 D. (x+1)2(x+2)2(x-2)

1. Simplify (x - y) (x1/3 - y1/2)
   1. x2 = xy + y2 B. x2/3 + x1/3 + y23/

C. x2/3 - x1/3 y1/3 - y2/3 D. x2 - xy + y2

1. Solve the following equation for x x2 + 2x + 1 = o

r2 r1

* 1. r2 B. 1/r2

C. –1/r2 D. 1/r

1. List the integral values of x which satisfy the inequality 1 < 5 < -2x < 7
2. Given value that 3x – 5y – 3 = 0

2y – 6x + 5 = 0

the value of (x, y) is

##### (-1/8, 19/24) B. (8,24/10)

C. (-8, 24/19) D. (19/24, -1/8)

1. The solution of the quadratic equation

bx2 + qx + b = 0

A -bb 4ac B -b ppb 2a 2a

C -qq2- 4bp D -qp2 - 4bp

|  |  |  |  |
| --- | --- | --- | --- |
| 2p | | 2p | |
| Simplify 1 +  (x2+5x+6) | | 1  (x2 + 3x + 2) |  |
| A. x + 3 | | B. | 1 |
| (x+1) (x+2) | |  | (x+1) x+2) x+3) |
| C. | 2 | D. | 4 |
|  | (x+1) (x+3) |  | (x+1) (x+3) |

1. Evaluate (4a2 - 4ab2)

(2a2 + 5ab - 7b2)

* 1. a - b B. 2a + 7b 2a + b a - b

C. 2a - 7b D. 2a - 7b a + b a - b

#### Using the graph to answer questions 25 and 26 31. S

**T**



***x*o**

**Q**

**3*x*o**

**40O**

**P**



***y***

**4**

**3**

**2**

**1**

**-4 -3 -2 -1**

**0 1**

**2 1**

**-2**

**-1**

**R**

In the figure above, PQ is parallel to ST and QRS = 400. find the value of x

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 55 | B. | 60 |
| C. | 65 | D. | 75 |

1. What is the solution of the equation x2 – x – 1 = 0?
   1. x= 1.6andx=-0.6 B. x= -1.6andx= 0.6

C. x= 1.6andx=0.6 D. x= -1.6andx=-0.6

1. For what values of x is the curve y = (x2 + 3) / (x + 4)

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -3 < x< 0 | B. | –3 < x < 0 |
| C. | 0 < x < 3 | D. | 0 < x < 3 |

1. The solution of x2 – 2x – 1 0 are the points of intersection of two graphs. If one of the graphs is y= 2 + x – x2, find the second graph.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | y = 1 – x | B. | y = 1 + x |
| C. | y = x – 1 | D. | y = 3x + 3 |

1. If the sum of the 8th and 9th terms of an arithmetic progression is 72 and the 4thterm is –6, find the common difference.

##### 4 B. 8

1. For which of the following exterior angles is a regular polygon possible?

i 350 ii 180 iii. 1150

* 1. i and ii B. ii only

C. ii and iii D. iii only

**Q**

**R**

**9cm**

**Y**

**T**

**P 7cm S**

In the figure above, PS = 7cm and RY = 9cm. If the area of parallelogram PQRS is 56cm2, find the area of trapezium PQTS.

A. 56cm2 B. 112cm2

C. 120cm2 D. 1762

C. 62/ D. 91/ 34. A quadrilateral of a circle of radius 6cm is cut away

3 3

1. If 7 and 189 are the first and fourth terms of a geometric progression respectively find the sum of the first three terms of the progression.

##### 182 B. 91

C. 63 D. 28

35.

from each corner of a rectangle 25cm long and 18cm wide. Find the perimeter of the remaining figure

A. 38cm B. (38+12p)cm

C. (86-12p)cm D. (86-6p)cm



**Q**

**P**

**120O**

**100O**

**R**

**T**

**S**



In the figure above STQ = SRP, PT = TQ = 6cm and QS

= 5cm. Find SR.

##### 47/5 B. 5

##### C. 37/5 D. 22/5

In the figure above, PQRS is a circle. If chords QR and RS are equal, calculate the value of x

1. Four interior angles o f a pentagon are 900 – x0, 900 + x0, 100 – 2x0, 1100 + 2x0. find the fifth interior angle.

##### 1100 B. 1200

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 800 | B. | 600 | C. | 1300 | D. | 1400 |
| C. | 450 | D. | 400 |  |  |  |  |

37.  45.



**60 cm**

**30 cm**



**50O**

In the figure above, PS = RS = QS and QSR = 500. find QPR.

##### A. 250 B. 400

C. 500 D. 650 In the figure above, a solid consists of a hemisphere surmounted by a right circular cone with radius 3.0cm

1. **Z**



**55O**

**Y**

**P**

**R**

**45O X**

and height 6.0cm. find the volume of the solid.

* 1. 18pcm3 B. 36pcm3

C. 54pcm3 D. 108pcm3

1. PQR is a triangle in which PQ= 10ccm and QPR = 600. S is a point equidistant from P and Q. also S is a point equidistant from PQ and PR. If U is the foot of the perpendicular from S on PR, find the length SU in cm to one decimalplace.

##### 2.7 B. 2.9

C. 3.1 D. 3.3

**Q**

In the figure above, XR and YQ are tangents to the circle YZXP if ZXR = 450 and YZX = 550 find ZYQ.

1. In a class of 150 students, the sector in a pie chart representing the students offering Physics has angle

120. How many students are offering Physics?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 1350 | B. | 1250 | A. | 18 | B. | 15 |
| C. | 1000 | D. | 900 | C. | 10 | D. | 5 |

1. From a point 143 metres away from a tree, a man discovers that the angle of elevation of the tree is 300. If the man measures this angle of elevation from a point 2meters above the ground how high is the tree?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 12m | B. | 14m | A. | 1.6 | B. | 1.2 |
| C. | 143m | D. | 16m | C. | 1.1 | D. | 1.0 |

1. If x and y represents the mean and the median respectively of the following set of numbers; 11, 12,13,14,15,16,17,18,19,21,. Find x/y correct to one decimal place.
2. Alero starts a 3km walk from P on a bearing 0230. she then walks 4km on a bearing 1130 to Q what is the bearing of Q fromP?

##### 26052’ B. 5208’

C. 7608’ D. 900

1. If cot q = x/y, find cosec q
   1. 1/y(x2+y)



B. (x/y)



In the distribution above, the mode and the median respectively are

##### 1.3 B. 1.2

C. 3.3 D. 0.2

C. 1/y(x2+y) D. y/x

1. In triangle PQR, PQ = 1cm, QR = 2cm and PQR = 1200. Find the longest side of thetriangle

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3 | B. | 3 7/7 |
| C. | 3 7 | D. | 7 |

44. If a metal pipe 10cm long has an external diameter of 12cm and a thickness of 1cm, find the volume of the metal used in making the pipe.

1. If two dice are thrown together, what is the probability of obtaining at least a score of 10?
   1. 1/6 B. 1/12

C. 5/6 D. 11/12

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 120pcm3 | B. | 110pcm3 |
| C. | 60pcm3 | D. | 50pcm3 |

# Mathematics 1989

1. Which of the following is in descending order?

##### 9/10,4/5,3/4,17/10 B. 4/5,9/10,3/4,17/20

C. 6/10,17/20,4/5,3/4 D. 4/5,9/10,17/10,3/4

1. Evaluate 2,700, 000 x 0.03 ¸18,000
   1. 4.5 x 100 B. 4.5 x 101

C. 4.5 x 102 D. 4.5 x 103

1. The prime factors of 2,520 are

##### 2,9,5, B. 2,9,7,

C. 2,3,5,7, D. 2,3,7,9,

1. Make R the subject of the formula S = R  )

(3RT)

* 1. R = T B. T (TS2 - 1) 2(TS2 - 1)

C R = T D. T

(TS2 + 1) 2(TS2 + 1)

1. Find the value of the expression

32 - 64 81 when x = -3/4 81x3 xx2 16

1. If 12 = X find x where e = 12 A. 101/ B. 101/

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| e  A. | 7  20 | B. | 15 | C. | 2  33/  8 | D. | – 61/  13 2 |
| C. | 14 | D. | 12 |  |  |  |  |

1. Simplify 364r -6)1/2
   1. r B. 2r

C. 1/2r D. 2/r

1. What is the difference between 0.007685 correct to three significant figures and 0.007685 correct to four places of decimal?
   1. 10-5 B. 7 x 10-4

C. 8 x 10-5 D. 10 -6

1. If a : b = 5: 8, x : y = 25 : 16, evaluate a/x : b/y

##### 125:128 B. 3:5

1. The cost of dinner for a group of students is partly cconstant and partly varies directly as the number of students. If the cost is #74.00 when the number of students is 20, and #96.00 when the number is 30, find the cost when there are 15 students.

##### #68.50 B. #63.00

C. #60.00 D. #52.00

1. If f(x) = 2x2 + 5x + 3, find f(x + 1)

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 2x2 – x | B. | 2x2 – x + 10 |
| C. | 4x2 + 3x + 2 | D. | 4x2 + 3x + 12 |

1. Solve the positive number x suchthat

2(x3 – x2 – 2x) = 1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| C. | 3:4 | D. 2:5 | A. | 4 | B. | 3 |
|  |  |  | C. | 2 | D. | 1 |

1. Oke deposited #800.00 in the bank aat the rat of 121/2% simple interest. After some time the total amount was one and half times the principal. For how many years was the money left in the bank

2

##### 2 B. 4

##### C. 51/ D. 8

1. If the surface area of a sphere is increased by 44%. Find the percentage increase in its diameter.

##### 44 B. 30

##### C. 22 D. 20

1. Simplify 4 - 1

(2-3)

##### 23 B. 2., 3

C. –2 + 3 D. 2, -3

1. Find p in terms of q if Log p + 3log q = 3

3 3

* 1. (3)3 B. (q)1/3

(q) (3)

C. (q)3 D. (3)1/3

(3) (q)

1. What are the values of y which satisfy the equation 9y – 4 ( 3y) + 3 = 0
2. Simplify (32x - 4x2) (2x + 18)
   1. 2(x- 9) B. 2(9 + x )

C. 81 – x2 D. –2(x - 9)

1. Factorize completely y3 – 4xy + xy3 – 4y
   1. (x + xy)(y+ 2)(y - 2)
   2. (y + xy)(y + 2)(y - 2)
   3. y(1 + x)(y + 2)(y - 2)
   4. y(1 - x)(y + 2)(y - 2)
2. If one of x3 – 8-1 is x – 2–1 , the other factors is
   1. x2 + 2-1 x– 4-1 B. x2 - 2-1 x – 4-1

C. x2 + 2-1 x+ 4-1 D. x2 + 2-1 x –4-1

1. Factorize 4a2 + 12ab – c2+ 9b2
   1. 4a(a – 3b) + (3b - c)2
   2. (2a + 3b – c )(2a + 3b + c)
   3. (2a – 3b -c)(2a –3b + c)
   4. 4a(a – 3b) + (3b +c)2
2. What are K and L respectively if ½ (3y – 4x)2 = (8x2 + kxy + Ly2)

##### -12, 9/2 B. –6, 9

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | -1 and 0 | B. | –1 and 1 | C. | 6, 9 | D. | 12, 9/2 |
| C. | 1 and 3 | D. | 0 and 1 |  |  |  |  |

1. Solve the pair of equation for x and y respectively 2x-1 – 3y-1 = 4

4x-1 + y-1 = 1

##### -1,2 B. 1,2

C. 2,1 D. 2,-1

1. What value of Q will make the expression 4x2 + 5x + Q a complete square?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 25/16 | B. | 25/64 |
| C. | 5/8 | D. | 5/4 |

1. Find the range of values of r which satisfies the following inequality, where a, b and c are positive. r/a+r/b+r/c >1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| B. r>abc | A. | 1200 | B. | 110 |
|  | C. | 600 | D. | 200 |

* 1. r> abc

bc + ac + ab

C. r > 1/a + 1/b+ 1/c D. r>1/abc

1. Express 1 - 1

(x + 1) (x - 2)

##### -3 B. 3

(x +1)(2-x) (x+1)2-X)

##### C. -1 D. 1

(x+1)(x-2) (x+1)(x-2)

1. Simplify x - (x+ 1 ) 1/2

(x + 1) (x + 1) 1/2

##### 1,10 B. 2,10

C. 3,13 D. 4,16

**M**

**N**

**Q**

**R**

MN is a tagent to the given circle at M, MR and MQ are two chords. If QMN is 600 and MNQ is 400, find RMQ

**P**



**H**

**K**

### Q R

In the diagram above, HK is prallel to QR, PH = 4cm and HQ = 3cm. What is the ratio of KR;PR?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 7:3 | B. | 3:7 |
| C. | 3:4 | D. | 4:3 |

##### 1 B. - 1

x + 1 x+ 1

##### 1 D. 1

* 1. x + 1

***y***

1. A regular polygon of (2k + 1) sides has 1400 as the size of each interior angel. Find K.

##### 4 B. 41/

2

C. 8 D. 81/



**S**

**T**

**24O**

2

***x***



***a***

***b***

***g***

**c *k***

***d***

***h***

***m***

***f***

***l***

**-1**

**1**

**2**

**3 *i* 4**

**5 6**

***e***

***j***

On the curve above, the points at which the gradient of

the curve is equal to zeroare 35.

A. c.d.f.i.l B. b.e.g.j.m

C. a.b.c.d.f.i.j.l. D. c.d.f.h.i.l

1. The sum of the first two terms of a geometric progression is x and the sum of the last two terms is y. if there are n terms in all, then the common ratio is

|  |  |  |  |
| --- | --- | --- | --- |
| A. | x/y | B. | y/x |
| C. | (x/y)1/2 | D. | (y/x)1/2 |

**P Q R**

If PST is a straight line and PQ = QS = SR in the above diagram, find y

##### A. 240 B. 480

C. 720 D. 840

**S**



**R 60O**

**Q**

**P**

In the abovediagram PQ is parallel to RS and QS bisects PQR. If PQR is 600, find x

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 30. | If –8, m,n, 19 in arithmetic progression, find (m, n) | A. | 300 | B. | 400 |
|  |  | C. | 600 | D. | 1200 |

1. PQRS is a rhombus. If PR2 + QS2 = kPQ2. Determine k.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1 | B. | 2 |
| C. | 3 | D. | 4 |

1. In DXYZ, Y = Z = 300 and XZ = 3cm find YZ **45. O**

**X**

**T**

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3/2cm | B. | 33/2cm |
| C. | 33cm | D. | 23cm |

1. In DPQR, the bisector of QPR meets QR at S. the line PQ is produced to V and the bisector of VQS meets PS produced at T. if QPR = 460 and QST = 750, calculate

QTS **W**

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 410 | B. | 520 |
| C. | 640 | D. | 820 |

### Y

**Z**

1. **Y**



**S**

**O**

**3*y***

**O**

***y***

**56O**

**P R**

**Q**

A. If PQR is a straight line with OS = = QR, calculate TPQ, if QT//SR and TQS = 3y0.

##### A. 620 B. 560

##### C. 202/ 0 D. 182/ 0

OXYZW is a pyramid with a square base such that OX

= OY = OZ = OW = 5cm and XY = XW = YZ = WZ =

6cm. Find the height OT.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 25 | B. | 3 |
| C. | 4 | D. | 7 |

1. In preparing rice cutlets, a cook used 75g of rice, 40g of margarine, 105g of meat and 20g of bread crumbs. Find the angle of the sector which represents meat in a pie chart.

##### 300 B. 600

##### C. 112.50 D. 157.50

1. In a class of 30 students, the marks scored in an

3

1. **R**



**Z**

**X**

**S**

3

examination are displayed in the following histogram.

**10**

**No . of students**

**8**

**6**

### T

If x : y = 5:12 and z = 52cm, find the perimeter of the triangle.

* 1. 68cm B. 84cm

C. 100cm D. 120cm

1. The pilot of an aeroplane, flying 10km above the ground in the direction of a landmark, views the landmark to have angle of depression of 350 and 550. find the distance between the two points of observation
   1. 10(sin 350 – sin550)
   2. 10(cos 350 – cos 550)
   3. 10(tan 350 –tan 550)
   4. 10(cot 350 – cot550)
2. A sin2x – 3 = 0, find x if 0 < x < 900

##### 300 B. 450

C. 600 D. 900

1. A square tile has side 30cm. How many of these tiles cover a rectangular floor of length 7.2cm and width 4.2m?

**4**

**2**

**0 20 40 60 80 100**

**Marks scored**

What percentage of the students scored more than 40%

##### 14% B. 40%

C. 452/ % D. 531/ %

3 3

1. In a family of 21 people, the average age is 14years. If the age of the grandfather is not counted, the average age drops to 12years. What is the age of the grandfather?
   1. 35years B. 40years

C. 42years D. 54years

1. If n is the median and m is the mode of the following set of numbers,2.4,2.1,1.6,2.6,2.6,3.7,2.,1,2.6, then (n, m) is

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 336 | B. | 420 | A. | (2.6,2.6) | B. | (2.5,2.6) |
| C. | 576 | D. | 720 | C. | (2.6,2.5) | D. | (2.5,2.1) |

1. A cylindrical metal pipe 1m long has an outer diameter of 7.2cm and an inner diameter of 2.8cm. find the volume of metal used for thecylinder.
2. The numbers are chosen at random from three numbers 1,3,6. find the probability that the sum of the two is not odd.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 440pcm3 | B. | 1,100pcm3 | A. | 2/3 | B. | ½ |
| C. | 4,400pcm3 | D. | 11,000pcm3 | C. | 1/3 | D. | 1/6 |

# Mathematics 1990

1. Simplify (43/4 - 61/4) (41/5 of 1 1/4)

##### -77/ B. –2/7

8

C. –10/21 D. 10/21

1. The H.C.F. of a2bx + abx2 and a2b – b3 is

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | b | B. | a + b | A. | Z2y = C | B. | Y= CZ2 |
| C. | a(a + b) | D. | abx (a2 – b2) | C. | Y = CZ2 | D. | Y= C |

1. If a = 2, b = -2 and c = -1/2, evaluate (ab2 – bc2) (a2c - abc)

##### 0 B. 28

C. –30 D. 34

1. Y varies inversely as x2 and X varies directly as Z2. find the relationship between Y and Z, if C is a constant.
2. Correct 241.34 (3 x 10-3)2 to 4 significant figures

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 0.0014 | B. | 0.001448 |
| C. | 0.0022 | D. | 0.002172 |

1. At what rate would a sum of #100.00 deposited for 5 yearsraise an interest of #7.50?

##### 11/ % B. 21/ %

2 2

##### C. 15% D. 25%

1. Three children shared a basket of mangoes in such a way that the first child took ¼ of the mangoes and the second ¾ of the remainder. What fraction of the mangoes did the third child take?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 3/16 | B. | 7/16 | A. | (x+ y) (5x+ y) | B. | (x+ y)2 |
| C. | 9/16 | D. | 13/16 | C. | (x+ 5y) (5x+ y) | D. | 5(x+y)2 |

1. Find the value of r in terms of p and q in the following equation

P/2 = (r/(r+q)

* 1. r = q B. pq2

2 - p2 2 - q2

C. r = p2q2 D. p 2 - pq q(2-p)

1. If f(x - 4) = x2 + 2x + 3, find f(2)

##### 6 B. 11

C. 27 D. 51

1. Factorize 9(x + y)2 – 4(x - y)2
2. Simplify and express in standard form

(0.00275 x 0.00640/( 0.025x 0.08)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A. | 8.8 x 10-1 B. | 8.8 x 102 | A. | 3, -3 | B. | 2, -2 |
| C. | 8.8 x 10-3 D. | 8.8 x 103 | C. | 1, -1 | D. | 3, -1 |

1. If a2 + b2 = 16 and 2ab = 7 find all the possible values of (a – b )
2. Three brothers in a business deal share the profit at the end of contract. The first received 1/3 of the profit and the second 2/3 of the remainder. If the third received the remaining #12.000.00, how much profit did they
3. Divide x3 – 2x2 – 5x + 6 by (x - 1)
   1. x2 – x –6 B. x2 – 5x + 6

C. x2 –7x + 6 D. x2 – 5x - 6

1. If x + = 4, find the x2 + 1/x

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| share? |  |  |  | A. | 16 | B. | 14 |
| A. | #60,000.00 | B. | #54,000.00 | C. | 12 | D. | 9 |
| C. | #48,000.00 | D. | #42,000.00 |  |  |  |  |

1. Simplify 160r2+  (71r4 + 100r3
   1. 9r2 B.



12 3r

13r

C. 13r D.

1. Simplify27 + 3/3
2. What must be added to 4x2 – 4 to make it a perfect square?
   1. -1/x2 B. 1/x2

##### C. 1 D. -1

1. Find the solution of the equation x – 8 x + 15 = 0

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 43 | B. | 4/3 | A. | 3, 5 | B. | –3, -5 |
| C. | 33 | D. | 3/4 | C. | 9, 25 | D. | –9, 25 |

1. Simplify 3Log69 + Log612 + Log664 – Log672

##### 5 B. 7776

C. Log 31 D. (7776)6

6

1. Simplify (1 + 1 ) -1
   * 1. y-1
   1. x/y B. xy
2. The lengths of the sides of a right-angled triangle are xcm. (3x-1)cmand (3x + 1)cm. Find x

##### 5 B. 7

C. 8 D. 12

1. The perimeter of a rectangular lawn is 24m, if the area of the lawn is 35m2, how wide is the lawn?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C. | y/x | D. | (xy)-1 | A. | 5m | B. | 7m |
|  |  |  |  | C. | 12m | D. | 14m |

1. Simplify x + y - x2

(x+y) (x-y) (x2 - y2)

* 1. x2 B. y2

x2 - y2 x2 - y2

C. x D. y

x2 - y2 x2 - y2

1. Given that x2 + y2 + z2 = 194, calculate z if x = 7 and y = 3

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 10 | B. | 8 |
| C. | 12.2 | D. | 13.4 |

1. Find the sum of the first twenty terms of the arithmetic progression Log a, Log a2, Log a3
   1. log a20 B. log a21

C. log a200 D. log a210

1. The angle of a sector of a circle, radius 10.5cm, is 480. calculate the perimeter of the sector
   1. 8.8cm B. 25.4cm

C. 25.6cm D. 29.8cm



**100O**

In the figure above PS = QS and QSR = 1000, find QPR

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A. | 400 | B. | 500 |
| 24. A carpainter charges #40.00 per day for himself and | C. | 800 | D. | 1000 |
| #10.00 per day for his assistant. If a fleet of a cars were |  |  |  |  |
| painted for #2,000.00 and the painter worked 10 days | 34. |  |  |  |
| more than his assistant, how much did the assistant |  |  |  |  |
| receive? |  |  |  |  |
| A. #32.00 B. #320.00 |  |  |  |  |

1. Find the sum of the first 18 terms of the progression 3, 6, 12 ………..



|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3(217 - 1) | B. | 3(218 ) - 1 ) |
| C. | 3(218 + 1) | D. | 3(218 - 1) |

***y***

**-1**

**0**

**2 *x***

In triangle XYZ and XQP, XP= 4cm, XQ= 5cm and PQ = QY = 3ccm. Find ZY

* 1. 8cm B. 6ccm

C. 4cm D. 3cm

What is the equation of the quadratic function represented by the graph above?

1. Find the length of a side of a rhombus whose diagonals are 6cm and 8cm.
   1. 8cm B. 5cm

C. 4cm D. 3cm

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 30. | A.  C.  At what | y = x2 + x - 2 y = -x2 – x + 2  value of x is the | B.  D.  functionx2 | y = x2 – x –2 y = -x + x + 2  + x + 1 minimum? | 1. Each of the interior angles of a regular polygon is 1400. how many sides has the polygon?    1. 9 B. 8 |
|  | A. | -1 | B. | –1/2 | C. 7 D. 5 |
|  | C. | ½ | D. | 1 |  |

1. **S**



**R**

**P**

**81O**

***x***

**22O**

**Q**

**T**

31.

**Q**

**R**

**P S**

In the diagram above, the area of PQRS is 73.5cm2 and its height is 10.5cm. find the length of PS if QR is one- third of PS.

In the figure above, PQRS is a circle. If PQT and SRT are straight lines, find the value of x.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 21cm | B. | 171/ cm  2 | A. | 590 | B. | 770 |
| C. | 14cm | D. | 101/ cm  2 | C. | 1030 | D. | 1210 |

1. In a regular pentagon, PQRST, PR intersects QS at O. calculate RQS.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 360 | B. | 720 |
| C. | 1080 | D. | 1440 |

1. If cos q = 12/13, find 1 + cot2 q

##### 169/25 B. 25/169

C. 169/144 D. 144/169

44.

1. Find the curved surface area of the frustrum in the figure.

**4 cm**

**6 cm**

**6 cm**

**X** A. B.

**8 cm**

**Y**



16 10cm



20 10

##### C. 24 D.

## Z

In the figure above, YXZ = 300, XYZ = 1050 and XY = 8cm. CalculateYZ.

A. 162cm B. 82cm

C. 42cm D. 22cm





In the figure above PQR is a semicircle. Calculate the area of the shaded region.

A. 1252/ cm2 B. 1492/ cm2

1. The locus of a point which moves so that it is equidistant from two intersecting straight lines is the
   1. perpendicular bisector of the two lines
   2. angle bisector of the two lines
   3. bisector of the two lines
   4. line parallel to the two lines

46 4, 16, 30, 20, 10, 14 and 26 are represented on a piechart. Find the sum of the angles of the sectors representing all numbers equal to or greater than 16.

##### 480 B. 840

C. 920 D. 2760

1. The mean of ten positive numbers is 16. when another number is added, the mean becomes 18. find the eleventh number.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3 | B. | 16 |
| C. | 18 | D. | 30 |

1. Below are the scores of a group of students in a test.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

If the average score is 3.5, find the value of x.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1 | B. | 2 |
| C. | 3 | D. | 4 |

1. Twonumbers are removed at random from the numbers

1,2,3 and 4. what is the probability that the sum of the numbers removed is even?

7 7

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C. | 2431/ cm2 | D. | 2671/ cm2 | A. | 2/3 | B. | ½ |
|  |  |  |  | C. | 1/3 | D. | ¼ |

7 2

1. A cylindrical pipe, made of metal is 3cm, thick if the internal radius of the pipe is 10cm. Find the volume of metal used in making 3m of the pipe
2. Find the probability that a number selected at random from 41 to 56 is a multiple of 9

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 153cm3 | B. | 207cm3 | A. | 1/9 | B. | 2/15 |
| C. | 15,300cm3 | D. | 20,700cm3 | C. | 3/16 | D. | 7/8 |

1. If the height of two circular cylinders are in the ratio 2:3 and their base radii are in the ratio 9. what is the ratio of their volume

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 27:32 | B. | 27:23 |
| C. | 23:32 | D. | 21:27 |

# Mathematics 1991

1. Simplify 31/ – 11/ x 2/ + 12/ 13. Evaluate (Xy2 - X2y)

3 4 3 5

* 1. 217/30 B. 39/10

C. 41/10 D. 4 11/36

1. If 2257 is the result of subtracting 4577 from 7056 in base n, find n.

##### 8 B. 9

C. 10 D. 11

1. Find correct to 3 decimal places

( 1  1

##### 0.05 5.005 - (0.05X2.05)

(x2 - xy) when x = -2 and y = 3

##### A. -3 B. –3/5

C. 3/5 D. 3

1. A car travels from Calabar to Enugu, a distant of pkm with an average speed of ukm per hour and continues to Benin, a distance of qkm, with an average speed of wkm per hour. Find its average speed from Calabar to Benin.
   1. (p+q)/(up+wq) B. u+w

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 99.998 | B. | 98.999 |  |  |
| C. | 89.899 | D. | 9.998 | C. | uw(p+q)/(wp+uq) D. (wp+uq)/(u+wq) |

1. Express 62/3 as a decimal correct to 3 significant figures.

##### 20.6 B. 20.667

C. 20.67 D. 20.7

1. Factory P produces 20,000 bags of cement per day while factory Q produces 15,000 bags per day. If P reduces production by 5% and Q increases production by 5% determine the effective loss in the number of bags produced per day by the twofactories.
2. If w varies inversely as uv/u + v and is equal to 8 when u = 2 and v = 6, find a relationship between u, v, w.
   1. upw = 16(u + t) B. 16ur = 3w(u + t)

C. upw = 12(u + t) D. 12upw = u + r

1. If g(x = x2 + 3x ) find g(x + 1) – g(x)
   1. (x+ 2) B. 2(x+ 2)

C. (2x+ 1) D. (x+ 4)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 250 | B. | 750 | 17. | Factorize m3 – m2 – m + 2 | |  |
| C. | 1000 | D. | 1250 |  | 1. (m2 + 1)(m - 2) 2. (m + 1)(m+ 1)(m + 2) | |  |
| 1. Musa borrows #10.00 at 2% per month interest and repays #8.00 after 4 months. However much does he still owe?    1. #10.80 B. #10.67 | | | | 18. | 1. (m + 1)(m+ 1)(m - 2) 2. (m2 + 2)(m - 1)   Factorize 1 – (a - b)2 | |  |
| C. | #2.80 | C. | #2.67 |  | A.  C. | (1 – a - b)(1 – a - b) B.  (1 – a + b)(1 – a + b) D. | (1 – a + b)(1 + a - b)  (1 – a - b)(1 + a - b) |

1. If 3 gallons of spirit containing 20% water are added to 5gallons of another spirit containing 15% water, what

percentage of the mixture is water?

##### 24/ % B. 167/ %

C. 1815/ % D. 187/8%

8 8

1. Which of the following is a factor of rs + tr – pt –ps?
   1. (p - s) B. (s - p)

C. (r - p) D. (r + p)

1. Find the two values of y which satisfy the simultaneous
2. What is the product of 27/5 – (3)3 and (1/5)? equation 3x + y = 8

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 5 | B. | 3 |  | x2 + xy = 6 |  |  |
| C. | 1 | D. | 1/25 | A. | -1 and 5 | B. | –5 and 1 |
|  |  |  |  | C. | 1 and 5 | D. | 1 and 1 |

1. Simplify 2log2/5 – log72/125 + log9
   1. 1 – 4log 3 B. –1 + 2log3

C. –1 +5log2 D. 1-2log2

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 10. | Rationalize (23 + 32)/(32 - 23) | | |  |  | A. | x < 12/13B. | x < 13 |  |
|  | A. | 5 - 2 6 | B. | 5 + 2 6 | | C. | x < 9 | D. | x < 13/12 |
|  | C. | 53 | D. | 5 |  |  |  |  |  |
| 22. Find the positive number n, such that thrice it  11. Simplify(1/3 + 5) – 1/3 - 5 is equal to twelve times the number. | | | | | | | | | |
|  | A. | -1/2 5 | B. | 1/2 | 5 | A. | 1 | B. | 2 |
|  | C. | –1/4 5 | D. | 0 |  | C. | 3 | D. | 4 |
| 12. Multiply (x2 –3x - + 1)2 by (x - a) 23. Solve the equation (x - 2)(x - 3) = 12 | | | | | | | | | |
|  | A. x3 – (3 - a)x2 + (1 + 3a)x –1 | | |  |  | A. | 2,3 | B. | 3,6 |
|  | B. x3 – (3 - a)x2 + 3ax – a | | |  |  | C. | –1,6 | D. | 1,6 |
|  | C. x3 – (3 - a)x2 + (1 + 3a) – a | | |  |  |  |  |  |  |
|  | D. x3 + (3 - a)x2 + (1 + 3a) - a | | |  |  |  |  |  |  |



1. Find the range of values of x which satisfy the inequality (x/2 + x/3 +x/4) < 1

s square





1. Simplify 1 + x + x)

( 1 + X -  x)

1. If the exterior angles of a pentagon are x0, (x + 5)0, (x + 10)0, (x + 15)0 and (x + 20)0, find x

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A. 1- 2x - 2x  x | B. 1 +2x +2xx | A. | 1180 |  | B. | 720 |
| C. xx | D. 1 + 2x - 2x (1+x) | C. | 620 | D. | 360 |  |

1. Evaluate x2(x2 - 1)1/2 – (x2 – 1)1/2
   1. (x2 –1)1/2 B. (x2 –1)

C. (x2 – 1)-1 D. (x2 – 1)-1/2

1. Find the gradient of the line passing through the points (-2,0) and (0, -4)

##### 2 B. 4

C. –2 D. 4

1. At what value of x is the function y = x2 – 2x – 3 minimum?

A. 1

B.1

C.4

D.4

1. What is the nth term of the progression 27, 9,3, ?
   1. 27(1/3)n– 1 B. 3n +2

C. 27 +18(n - 1) D. 27 + 6(n - 1)

1. Find the sum of the 20 term in an arithmetic progression whose first term is 7 and last term is 117

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A. | 2480 | B. | 1240 | **30O** |
| C. | 620 | D. | 124 |  |

**use the figure below to answer questions 35 and 36**

**T**

**Q**

**M**

**N**

**P**

**R**

PMN and PQR are two secants of the circle MQTRN and PT is a tangent

1. If PM = 5cm, PN = 12cm and PQ = 4.8cm, calculate the respective lengths of PR and PT in centimeters.

##### 7.3,5.9 B. 7.7,12.5

C. 12.5,7.7 D. 5.9,7.3 36.

If PNR = 1100 and PMQ = 550, find MPQ.

##### A. 400 B. 300

C. 250 D. 150

37.



**152O**

***y***



**P Q**

**110O**

***x***

**120O**

**R**

38.

In the figure above, find the value of y

##### A. 280 B. 1220

C. 1500 D. 1520

**P**



**S**

**68O**

**T S**

In the figure above, find the value of x

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1300 | B. | 1100 |
| C. | 1000 | D. | 900 |

1. The angles of a quadrilateral are 5x – 30, 4x + 60, 60 – x

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | and 3x +  A.  C. | 61. find the smallest oft  5x – 30 B.  60 – x D. | | hese angles.  4x + 60  3x + 61. |  | **Q R**  In the figure above, PQ = QPS. | | **T**  PR = PS and SRTY= 680. find | |
| 32. | The area | of a square is | 144sqcm. | Find the length of its |  | A. | 1360 | B. | 1240 |
|  | diagonal |  |  |  |  | C. | 1120 | D. | 680 |
|  | A. 113cm | | B. | 12cm |  |  | | | |
| C. 122cm | | D. | 13cm | 39. | A flagstaff stands on the top of a vertical tower. A man | | | |
|  |  | | | |  | standing 60m away from the tower observes that the | | | |
| 33. | One angle of a rhombus is 600. the shorter of the two | | | |  | angles of elevation of the top and bottom of the flagstaff | | | |
|  | diagonals is 8cm long. Find the length of the longer | | | |  | are 640 and 620 respectively. Find the length of a flagstaff. | | | |
|  | one  A. 83 | | B. | 16/3 |  | A.  B. | 60(tan 620 – tan 640)  60(cot 640 – cot 620) | |  |
| C. 53 | | D. | 10/3 | C. | 60(cot 620 – cot 640) | |
|  |  | | | |  | D. | 60(tan 640 – tan620) | |  |

1. Simplify cos2x (sec2x + sec2x tan2x)
   1. Tan x B. Tan x secx

C. Sec2 x D. Cosec2 x

1. If cos x = a/b, find cosec x.
   1. b B. b

 b - a  a

C. b D.  b - a

 b - a a

1. From a point Z, 60m, north of X, a man walks 60Ö3m eastwards to another point Y. find the bearing of y from x.

##### 0300 B. 0450

C. 0600 D. 0900

1. A surveyor walks 500m up a hill which slopes at an angle of 300. calculate the vertical height through which he rises
2. 3% of a family’s income is spent on electricity. 9% on food. 20% on transport, 11% on education and 7% on extended family. The angles subtended at the centre of the pie chart under education and food are respectively
   1. 76.80 and 25.20 B. 10.80 and 224.60

C. 112.40 and 72.00 D. 39.60 and 212.40

**Use the following information to answer question 48 and 49.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **No of defective**  **per box** | **4** | **5** | **6** | **7** | **8** | **9** |
| **No . of boxes** | **2** | **7** | **17** | **10** | **8** | **6** |

Fifty boxes each of 50balls were inspected for the number which were defective. The following was the result

1. The mean and the median of the distribution are respectively

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 250m | B. | 500Ö3/3m | A. | 6.7,6 | B. | 6.7,6.5 |
| C. | 250Ö2m | D. | 250Ö3m | C. | 6,6.7 | D. | 6.5,6.7 |

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 96 | B. | 94 |
| C. | 92 | D. | 90 |

**P 4 cm Q**

1. Find the percentage of boxes containing at least 5 defective bolts each.

**8 cm**

**S**

**W 2 cm R**

**6 cm**

**V**

1. A crate of soft drinks contains 10bottles of Coca-cola, 8 of Fanta and 6 of Sprite. If one bottle s selected at random, what is the probability that it is NOT a Coca cola bottle?

In the figure above, PQRS is a square of side 8cm. What is the area of UVW?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 5/12 | B. | 1/3 |
| C. | ¾ | D. | 7/1 |

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 64sq.cm | B. | 54sq.cm |
| C. | 50sq.cm | D. | 10sq.cm |

1. Find the total area of the surface of a solid cylinder whose base radius is 4cm and height is 5cm.
   1. 56pcm2 B. 72pcm2

C. 96pcm2 D. 192pcm2



***x***

***a***

***y***

***a***

Find the volume of the figure above.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | pa2/3 | B. | pa2y |
| C. | pa2/3(y + x) | D. | (1/3pa2x + y) |

# Mathematics 1992

1. Find n if 34n = 100112

##### 5 B. 6

C. 7 D. 8

1. The radius of a circle is given as 5cm subject to an error of 0.1cm. what is the percentage error in the area of the circle.
2. Factorize 9p2 – q2 + 6pr – 9r2
   1. (3p – 3q + r)(3p – q – 9r)
   2. (6p – 3q + 3r)(3p – q – 4r)
   3. (3p – q + 3r)(3p + q – 3r)
   4. (3p – q + 3r)(3p – q – 3r)
3. Solve the equation y - 11 y + 24 = 0

##### 8,3 B. 64,9

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 1/25 | B. | ¼ | C. | 6,4 | D. | 9,-8 |
| C. | 4 | D. | 25 |  |  |  |  |

1. Evaluate Log an if b = 1/an

b

* 1. n2 B. n

C. 1/n D. 1/n

1. What is the value of x satisfying the equation 42y / 43x = 2?

##### -2 B. –1/2

##### C. ½ D. 2

1. Simplify {(1.25 x 104) x (2.0 x 10-1)

(6.25 x 105

* 1. 4.0 x 10-3 B. 5.0 x10-2

C. 2.0 x 10-1 D. 5.0 x 103

1. Simplify518 - 372 + 450

##### 174 B. 417

##### C. 172 D. 124

1. If x = 3 - 3, find x2 + 36 / x2

##### 9 B. 18

##### C. 24 D. 27

1. If x = {all prime factors of 44} and

y = {all prime factors of 60}, the elements of xyand xÇy respectivelyare.

* 1. {2,4,3,5,11} and {4}
  2. {4,3,5,11} and {3,4}
  3. {2,5,11} and{2}
  4. {2,3,5,11} and{2}

1. If U = {0,2,3,6,7,8,9,10} is the universal set, E = {0,4,6,8,} and F = {x: x2 = 26 ,}, x is odd}. Find (E~~C~~F)’ wheremeans the complement of aset
2. A man invested a sum of #280.00 partly at 59% and partly at 4%. If the total interest is #12.80 per annum, find the amount invested at 5%.

##### #14.00 B. #120.00

C. #140.00 D. #160.00

1. If x + 1 is a factor of x3 + 3x2 + kx +4, find the value of k

##### 6 B. 6

##### C. 8 D. 8

1. Resolve (3/x2 + x – 2) into partial fractions A. 1 - 1 B. 1 1

x-1 x+2 x + 2 x - 1

##### C. 1 - 1 D. 1 1

x + 1 x - 2 x - 2 + x + 1

1. Find all values of x satisfying the inequality –11 43x  28
   1. -5  x  18 B. 5  x  8

C. –8 x  5 D. –5 < x 8

|  |  |  |  |
| --- | --- | --- | --- |
|  | ***y* 4**  **3** |  | |
| **2** |
| **-3 -2 -1** | **0 1** | **2** | **3** |
|  | **-1** |  |  |
|  | **-2** |  |  |
|  | **-3** |  |  |

***x***

The sketch above is the curve of y = ax2 + bx + c. find a, b, and c respectively

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1,0,-4 | B. | –2,2,-4 |
| C. | 0,1,-4 | D. | 2,-2,-4 |

1. Find the sum of the infinity of the following series. 3 + 2 + 4/3 + 8/9 + 16/27 + ..

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | A. | 1270 | B. | 190 |
| A. | {0} |  | B. | U | C. | 18 | D. | 9 |
| C. | C | D. | f |  |  |  |  |  |

1. Make l the subject of the formula s = ut + ½ at2
   1. 1/a [u uas)] B. 1/a [-u (u2 - 2as]

C. 1/a [u(u2+ 2as) D. 1/a [-u(u2+ 2as)]

1. What is the nth term of the sequence 2,6,12,20,…?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 4n – 2 | B. | 2(3n - 1) |
| C. | n2 + n | D. | n2 + 3n +2 |

1. For an arithmetic sequence, the first term is 2 and the common difference is 3. find the sum of the fist 11 terms.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 157 | B. | 187 | 28. | **F** |
| C. | 197 | D. | 200 |  |  |

1. If the binary operation \* is defined by m\*n = mn + m + n for any real number m and n, find the identity element under this operation.



**H**

**x**

**109O**

**K**

**109O**

**G**

**M**

|  |  |  |  |
| --- | --- | --- | --- |
| A. | e = 1 | B. | e = -1 |
| C. | e = -2 | D. | e = 0 |

**Use the matrices below to answer questions 22 and 23**.

1. When PT is the transpose of P, calculate [PT] when x = 0,

|  |  |  |
| --- | --- | --- |
| y = 1 and z = 2 | | |
| A. | 48 | B. |
| C. | –24 | D. |
| PQ is equivalent to | | |
| A | PPT | B. |
| C. | QP | D. |

24

48

PP-T PP

1. **U P Q X**



If in the diagram above, FG is parallel to KM, find the value of x

##### 750 B. 950

##### C. 1050 D. 1250

1. X is a point due east of point Y on a coast Z is another point on the coast but 6.3km due south of Y. if the distance ZX is 12km, calculate the bearing of Z from X

##### 2400 B. 2100

##### C. 15008 D. 600



**6 cm**

**O**

**6 cm**

**105O**

**T S**

**20O**

**R**

In the figure above, TSP = 1050 and PRQ = 200, find PQR

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A. | 1300 | B. | 1200 |  | The above diagram is a circle with centre O. find the | | | |
|  | C. | 750 | D. | 300 |  | area of the shaded portion. | |  |  |
| 25. | If the angles of a quadrilateral are | | |  |  | A.  C. | 9cm2 18cm2 | B.  3D. | 9( -2)cm2 36cm2 |
|  | (p + 10)0, (p + 20)0 and 4p0, find p | | |  |  |  |  |  |  |
|  | A. | 63 | B. | 40 | 31. | The locus of a point which is equidistant from two | | | |
|  | C. | 36 | D. | 28 |  | given fixed points is the | |  |  |

**Q**



26.

* 1. perpendicular bisector of the straight line joining them
  2. parallel line to the straight line joining them
  3. transverse to the straight line joining them
  4. angle bisector of 900 which the straight line joining them makes with the horizontal

**P R** 32. What is the perpendicular distance of a point (2, 3 )from

**S** the line 2x – 4y + 3 = 0

##### 5/2 B. -5/20

In the figure above, PQR is a semicircle while PQ and QR are chords. QS is the perpendicular from Q to the diameter PR. What is the expression for QS?

1. QS =PS.SR
2. QS =(PS.SR)
3. QS = 2 (PS.SR)
4. QS =1/2(PS.SR)
5. Determine the distance on the earth’s surface between two towns P(Lat. 600N, Long. 200E) and Q(Lat. 600N, Long 250W)
   1. 800p/9km B. 800Ö3p/9km

C. 800pkm D. 800Ö3pkm

##### C. –5/13 D. 0

1. Find the equation of the line through (5, 7) parallel to the line7x + 5y = 12
   1. 5x + 7y = 120 B. 7x + 5y = 70

C. x + y= 7 D. 15x + 17y = 90

1. Given that q is an acute angle and sin q = m/n, find cot q.
   1. n2 - m2 B.



(n + m) (n - m)

m

m

m

##### D.



n2 - m2



n

n2 - m2

1. **Y** 43.

**15O**

**30O**

|  |  |  |  |
| --- | --- | --- | --- |
| **x 2** | **4** | **6** | **8** |
| **f 4** | **y** | **6** | **5** |

**R**

**X Z**

**10 cm**

In the figure above, if XZ is 10cm, calculate RY in cm

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 10 | B. | 10(1 – 1/Ö3) |
| C. | 10(1 - Ö3) | D. | 10(1 - 1Ö2) |

1. Evaluate lim (x-2) (x2+3x-2)

44.

If the mean of the above frequency distribution is 5.2, find y

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 6.0 | B. | 5.2 |
| C. | 5.0 | D. | 4.0 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No . of children 0** | **1 2** | **3 4** | **5** | **6** |
| **No . of families 7** | **11 6** | **7 7** | **5** | **3** |

Find the mode and median respectively of the

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | x-->2 | (x2-4) |  | distribution above |  |  |
| A. | 0 | B. | 2 | A. 2,1 | B. | 1,2 |
| C. | 3 | D. | 4 | C. 1,5 | D. | 5,2 |

1. If y = x, find d2y/dx2
   1. 2 cos x – x sin x B. sin x + x cos x

C. sin x – x cos x D. x sin x – 2 cos x

1. Ice forms on a refrigerator ice-box at the rate of (4 – 0.6t)g per minute after t minute. If initially there are 2g
2. If the scores of 3students in a test are 5,6 and 7 find the standard deviation of their scores

##### 2/3 B. 3/23

C.  2/3 D. 3/2

1. Sample variance can be defined as

of ice in the box, find the mass of ice formed in 5 minutes. S = 1/n n=1 (x1-x)2 and

* 1. 19.5 B. 17.0 S2= 1 n x x)

##### C. 14.5 D. 12.5

2

(n-1)

n 

1. Obtain a maximum value of the function

f(x) = x3 – 12x + 11

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | -5 | B. | –2 | A. | n =35 | B. | n > 35 |
| C. | 5 | D. | 27 | C. | n < 35 | D. | n = 5 |

Where n is the number of sample observations. There is no difference practically between the above definitions when

1. A student blows a ballon and its volume increases at a rate of p (20 – t2)ccm3s-1 after t seconds. If the initial volume of 0cm3, find the volume of the balloon after 2 seconds.

##### 37.00 B. 37.33

C. 40.00 D. 42.67

1. Evaluate the integral  cos 2xdx
2. Two perfect dice are throw together. Determine the probability of obtaining a total score of 8

##### 1/12 B. 5/36

C. 1/8 D. 7/36

1. The probability of an event P is ¾ while that of another Q is 1/6. if the probability of both P and Q is 1/12, what is the probability of either P or Q?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | -1/2 | B. | –1 | A. | 1/96 | B. | 1/8 |
| C. | ½ | D. | 1 | C. | 5/6 | D. | 11/12 |

1. A storekeeper checked his stock of five commodities and arrived at the followingstatistics.

**Commodity**

**F G H K M**

**Quantity**

**215**

**113**

**108**

**216**

**68**

What angle will commodity H represent on a pie chart?

##### 2160 B. 1080

1. Five people are to be arranged in a row for a group photograph. How many arrangements are there if a married couple in the group insist on sitting next to each other?
2. A student has 5 courses to take from Mathematics and Physics. There are 4 courses in Mathematics and 3 in Physics which he can choose from at will. In how many ways can he choose his courses so that he takes exactly two courses in Physics?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 48 | B. | 24 |
| C. | 20 | D. | 10 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C. | 680 | D. | 540 | A. | 11 | B. | 12 |
|  |  |  |  | C. | 10 | D. | 7 |

# Mathematics 1993

1. Change 71

to base 8 12. Which of the following is a factor of

10

A.

1078 B. 1068

##### C. 718 D. 178

15 + 7x – 2x2?

1. Evaluate 3524/0.05 correct to 3 significant figures.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A. | 705 | B. | 70000 | 13. |
| C. | 70480 | D. | 70500 |  |

|  |  |  |  |
| --- | --- | --- | --- |
| A. | x-3 | B. | x+3 |
| C. | x-5 | D. | x+5 |

Evaluate

(x+1/x+1)2 – (x-1/x-1) 2

1. If 9(x-1/2)= 3x2, find the value of x.

##### ½ B. 1

C. 2 D. 3

1. Solve for y in the equation 10y, X5(2y-2) x 4(y-1)=1

##### ¾ B. 2/

1. 4x2 B. (2/x+2) 2

C. 4 D. 4(1+x)

1. Solve the following simultaneous equations for x. x2 + y – 5= 0

|  |  |  |  |
| --- | --- | --- | --- |
|  | y – 7x  -2, 4 | + 3=0 |  |
| A. | B. | 2, 4 |
| C. | -1, 8 | D. | 1, -8 |

3

##### C. 1 D. 5/

4

1. Simplify 1/3-2 – 1/3+2

/

3

1. Solve the following equation

##### CA.. 40

BD.. 2

* 1. -(33/x,-21)(5x-4)=(3x-B2.) 2 1

1. If 2 log3

-4

y+ log = 4, then y is

x2

##### 2/ , 21 D. 2/ , 4/5

3 3

* 1. (4-log 3x2)/2 B. 4/log x2 16. **Q 30O**



**O**

***x*O**

***x*O**

**2*x***

**O**

3

##### C. 2/

X

3

1. ± 9/

X

1. Solve without using tables

log5 (62.5)-log5 (1/2) **T**

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3 | B. | 4 |
| C. | 5 | D. | 8 |

**P**

The figure above represents the graphs of y= x (2-x)

1. If #225.00 yields #27.00 in x years simple interest at the rate of 4%per annum, findx

and y = (x-1) (x-3). What are the x-coordinates of p, q and r respectively?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 3 | B. | 4 | A. | 1,3,2 | B. | 0,0,0 |
| C. | 12 | D. | 27 | C. | 0,2,3 | D. | 1,2,3 |

1. If the function f is defined by
2. f(x+2)=2x2 + 7x – 5, find f(-1)



**X**

**Y**

**Z**

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -10 | B. | -8 |
| C. | 4 | D. | 10 |

1. Divide the expression

x3 + 7x2 –x –7 by -1 +x2

|  |  |  |  |
| --- | --- | --- | --- |
| A. | –x3+7x2-x-7 | B. | –x3-7x+7 |
| C. | X-7 | D. | X+7 |

The shaded portion in the venn diagram above is

1. Simplify

1/p-1/q –p/q-q/p

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A. | | XÇZ | B. | XcÇYÇZ | | A. | | 1/p-q | B. | -1/p+q |
| C. | | XÇYcÇ Z | D. | XÇYÇZc | | C. | | 1/pq | D. | 1/pq(p-q) |
| 10. | If A. | x2 + 9= x+ 1, solve for x  5 B. | | 4 | 20. | | Solve the inequality  y2-3y>18 | | |  |
|  | C. | 3 D. | | 1 |  | | A. -2<y<6 B.  C. y>-3 or y>6 D. | | | y<-3 or y>6  y<-3 or y<6 |

1. Make x the subject of the relation 1+ax/1-ax = p/q
2. If x is negative, what is the range of values of x within which

|  |  |  |  |
| --- | --- | --- | --- |
| A. | p+q/a(p-q) | B. | p-q /a(p+q) |
| C. | p-q/apq | D. | pq/a(p-q) |

x+1/3 > 1/x+3

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3<x<4 | B. | -4<x<-3 |
| C. | -2<x<-1 | D. | -3<x<0 |

1. A man’s initial salary is #540.00 a month and increases after each period of six months by #36.00 a month. Find his salary in the eighth month of the third year.

**Q**

**O**

**0**

1. le

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A. | #828.00 | B. | #756.00 |  |  |  |  |  |
| C. | #720.00 | D. | #684.00 | **96** |  |  |  |  |
| If k+ geom | 1, 2k-1,3k+1  etric progressi | are three co on, find the | nsecutive terms of a possible values of the | **P**  In the and P | dia **R**a gr  OQ a d | above. O is the centre of iameter. If POR = 960 , find | | the circ the val |
| common ratio.  A. 0,8 | | B | -1, 5/3 | ORQ.  A. |  | 840 | B. | 480 |
| C. | 2, 3 | D. | 1, -1 | C. |  | 450 | D. | 420 |

ue of

1. A binary operation \* is defined on a set of real numbers by x\*y = xy for all real values of x and y, if x\*2 = x, find the possible values of x

##### 0, 1 B. 1, 2

C. 2, 2 D. 0,2

30.

### Q P



**340**

**730**

**R**

the diagram above, Q**T**P//

**S**

25

**P Q** In

730 and RS = RT. Find SRT

ST; PQR. = 340 , QRS=

##### A. 680 B. 1020

##### C. 1070 D. 1410

**T R** 31. **P T**



**U**

**S**

**Q**

**500**

*x*

**R**

### U V

### S

PQRST is a regular pentagon and PQVU is a rectangle with U and V lying on TS and SR respectively as shown in the diagram above. Calculate TUV

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A. | 180 | B. | 540 | In the figure above, PT is a tangent to the circle at u | | | |
|  | C. | 900 | D. | 1080 | and QU//RS. If TUR=350 and SRU = 50.0 find x. | | | |
|  |  |  |  |  | A. | 950 | B. | 850 |
| 26. | A regular polygon has 1500 as the size of each interior angle. How many sides has the polygon? | | | | C. | 500 | D. | 350 |
|  | A. 12  C. 9 |  | B. 10  D. 8 | 32. |  |  |  |  |
|  |  |  | **P** |  |  |

1. Calculate the length, in cm, of the arc of the circle of diameter 8cm which subtends an angle of 221/ 0



**3 cm**

**S**

2

* 1. 2  B.   **Q R**

##### C. 2/  D. /

3 2

In the diagram above, QPS = SPR, PR= 9cm, PQ=

1. 4cm and QS=3cm. Find SR.



**P**

**S**

**O**

* 1. 63/

4

##### C. 43/

* 1. 33/

##### D. 22/

8

**Q** 8 3

### T

1. The three sides of an isosceles triangle are of lengths

x+3, 2x+3, 2x-3 respectively. Calculate x.

##### 0 B. 1

##### C. 3 D. 6

In the diagram above, PQRS is a circle with O as centre and PQ//RT if RTS = 320 , find PSQ

##### A. 320 B. 450

##### C. 580 D. 900



**S**

**O**

**Q**

**T**

In the figure above, the line segment ST is tangent to the two circles at S and T. O and Q are the centres of the circles with OS = 5cm, QT = 2cm and OQ = 14cm. Find ST.

A. 7"3 B. 12cm

C. “87cm D. 7cm

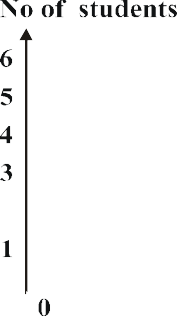
### P X Q

|  |  |
| --- | --- |
|  | **U** |
|  |  |

42 Quantities in the proportions 1,4,6,7 are to be represented in a pie chart. Calculate the angle of the sector with proportion 7

1. 200 B. 800

C. 1200 D. 1400



### T V

1. **Y R**

In the figure above, the area of the square **PQRS** is 100cm2. If the ratio of the area of the square **TUYS** to the area of the square **XQVU** is 1:16, find YR

A. 6cm B. 7cm

C. 8cm D. 9cm

1. Find the radius of a sphere whose surface area is 154cm2 (  =22/7)
   1. 7.00cm B. 3.50cm

C. 3.00cm D. 1.75cm

1. Find the area of the sector of a circle with radius 3m, if the angle of the sector is 600
   1. 4.0m2 B. 4.1m2

C. 4.7m2 D. 5.0m2

1. The angle between latitudes 300S and 130N is

##### 170 B. 330

C. 430 D. 530

1. If sin = cos 0, find 0 between 00 and 3600.

##### 450 ,2250 B. 1350 ,3150

C. 450 ,3150 D. 1350 ,2250



**300**

**5 m**

**450**

**Q**

The bar chart above shows the distribution of marks in a class test. How many students took the test?

##### 15 B. 20

C. 25 D. 50

1. The following marks were obtained by twenty students in an examination

53 30 70 84 59 43 90 20 78 48

44 60 81 73 50 37 67 68 64 52

Find the number of students who scored at least 50marks

##### 6 B. 10

C. 13 D. 14

1. 

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Estimate the mode of the frequency distribution above.

* 1. 13.2g B. 15.0g

C. 16.8g D. 17.5g

1. The mean of the ages of ten secondary school pupils is 16 but when the age of their teacher is added to it, the mean becomes 19. Find the age of the teacher.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 27 | B. | 35 |
| C. | 38 | D. | 49 |

47

### P H

|  |  |
| --- | --- |
|  |  |
| **1 - 5** | **2** |
| **6 - 10** | **4** |
| **11 - 15** | **5** |
| **16 - 20** | **2** |
| **21 - 25** | **3** |
| **26 - 30** | **2** |
| **31 - 35** | **1** |
| **36 - 40** | **1** |

From the figure above, calculate **TH** in centimeters.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 5/3+1) | B. | 5/3-1 |
| C. | 5/3 | D. | 3/5 |

1. If two angles of a triangle are 300 each and the longest side is 10cm, calculate the length of each of the other sides.

Find the median of the observations in the table

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 5cm | B. | 4cm |
| C. | 33cm | D. | 103/5cm |

|  |  |  |  |
| --- | --- | --- | --- |
| above. | | | |
| A. | 11.5 | B. | 12.5 |
| C. | 14.0 | D. | 14.5 |

1. A number is selected at random between 20 and 30 both numbers inclusive. Find the probability that the number is a prime
2. Calculate the standard deviation of the following data.

7, 8, 9, 10, 11, 12, 13.

##### 2 B. 4

C. 10 D. 11

1. The chances of three independent event X, Y, Z
   1. 2/

11

##### C. 6/

11

* 1. 5/

##### D. 8/

11

11

occurring are 1/ , 2/ , ¼ respectively. What are the chances of y and z only occurring?

##### A. 1/ B. 1/

2 3

8 24

* 1. 1/ D. ¼

12

# Mathematics 1994

1. Evaluate

1/ [5/ (9/ – 1 + 3/ )]

1. Simplify

[(2m - u)2 – (m – 2u)2]

3

* 1. 28/

39

##### C. 39/

28

7 10 4

* 1. 13/

84

##### D. 84/

13

(5m2 – 5u2)

##### A. ¾ B. 2/5

C. 2m – u/5m + u D. m – 2u/m + 5u

1. Evaluate (0.36x 5.4 x 0.63) (4.2 x 9.0 x 2.4)

correct to 2 significant figures

##### 0.013 B. 0.014

1. Factorize

a2x – b2y – b2x + a2y

##### C. 0.13 D. 0.14

1. Evaluate Log5(0.04) (Log318 – Log32)

##### 1 B. -1

C. 2/ D. -2/3

3

1. Without using tables, solve the equation
   1. (a - b)(x+ y) B. (y- x)(a - b)(a + b)

C. (x - y)(a- b)(a + b) D. (x + y)(a- b)(a + b)

1. Find the values of p and q such that (x - 1) and (x - 3) are factors of px3 + qx2 + 11x - 6

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -1,-6 | B. | 1,-6 |
| C. | 1,6 | D. | 6,-1 |

8x-2 = 2/ 13.

***y***

**0**

**(3.0)**

**(0.-27)**

25

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 4 | B. | 6 |
| C. | 8 | D. | 10 |
| Simply A. | 53 | 48 – 9/ 3+ 75  B. | 63 |
| C. | 83 | D. | 183 |

***x***

5

1. Given that “2 = 1.414, find without using tables, the

value of 1/ The equation of the graph above is

”2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 0.141 | B. | 0.301 | A. | y = (x - 3)3 | B. | y = (x + 3)3 |
| C. | 0.667 | D. | 0.707 | C. | y = x3 – 27 | D. | y = -x3 + 27 |

1. In a science class of 42 students, each offers at least one of Mathematics and Physics. If 22 students offer
2. If a = 1, b = 3, solve for x in the equation

a/a – x = b/x – b

Physics and 28 students offer Mathematics, find how many students offer Physics only?

##### 6 B. 8

1. 4/

##### C. 3/

1. 2/

2 D. ¾

3 3

##### 12 D. 14

1. Given that for sets A and B, in a universal set E, A B then

A(AB)’ is

##### A B. O**/**

1. Solve for r in the following equation

1/(r – 1) + 2/(r + 1) = 3/r

##### 3 B. 4

C. 5 D. 6

1. Find P if x – 3/(1 - x)(x + 2) = P/(1 – x) + Q/(x + 2)

##### C. B D. 

1. -2/
2. -5/
3. Solve for x if 25x + 3(5x) = 4
4. 5/

3 3

1. 2/

3 3

* 1. 1 or -4 B. 0

C. 1 D. -4 or 0

1. Find the range of values of x for which 1/x > 2 is true

|  |  |  |  |
| --- | --- | --- | --- |
| A. | x < ½ | B. | x < 0 or x > ½ |
| C. | 0 < x < ½ | D. | 1 < x < 2 |

18. 26.

***y***

**-4**

**-2**

**2x-y-2=0**

**0**

**-2**

**1**

**2**

**3**



**50O**

**30O**

***x***

Find the inequality which represents the shaded portion in the diagram

A. 2x – y – 2 £ 0 B. 2x – y – 2 ³ 0

C. 2x – y – 2 < 0 D. 2x – y – 2 > 0

1. If the 6th term of an arithmetic progression is 11 and the first term is 1, find the common difference.

27.

The equation of the line in the graph above is

A. 3y = 4x + 12 B. 3y = 3x + 12

C. 3y = -4x + 12 D. 3y = -4x + 9



**Q**

**38O**

**O**

**S**

**P**

**R**

A. 12/

C. -2

B. 5/

##### D. 2

5

3

1. Find the value of r if log r + log r2 + log r4 + log r8

+ log10r

16

+ log10r

10 10

= 63

10 10

##### 10-8 B. 100

32

##### C. 10 D. 102

1. Find the nth term of the sequence

3,6,10,15,21,…..

* 1. n(n - 1/2) B. n(n + 1/2)

C. (n + 1)(n + 2)/2 D. n(2n + 1)

1. A binary operation \* is defined on the set of all positive integers by a\*b = ab for all positive integers a,b. which of the followingproperties does NOT hold?
   1. Closure B. Associativity.

C. Identity. D. Inverse.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **O**x | **mod 10** | **2** | **4** | **6** | **8** |
|  | **2** | **4** | **8** | **2** | **6** |
|  | **4** | **8** | **6** | **4** | **2** |
|  | **6** | **2** | **4** | **6** | **8** |
|  | **8** | **6** | **2** | **8** | **4** |

In the diagram above, O is the centre of the circle. If SOQ is a diameter and <PRS is 380, what is the value of <PSQ?

##### 1480 B. 1040

C. 800 D. 520

1. If three angles of a quadrilateral are (3y – x - z)0, 3x0, (2z – 2y - x)0, find the fourth angle in terms of x, y, and z.
   1. (360 – x – y - z)0 B. (360 + x + y - z)0

C. (180 – x + y + z)0 D. (180 + x + y + z)0

1. An open rectangular box is made of wood 2cm thick. If the internal dimensions of the box are 50cm long, 36cm wide and 20cm deep, the volume of wood in the box is

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 11520cm3 | B. | 36000cm3 |
| C. | 38200cm3 | D. | 47520cm3 |

1. Calculate the perimeter in cm, of a sector of a circle of radius 8cm and angle 450

The multiplication table above has modulo 10 on the

set S = {2,4,6,8}. Find the inverse of 2 31.3

1

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A. | 2 |  |  | B. |  | 4 |
| C. | 6 |  |  | D. |  | 8 |
| Solve for x and y | | | | | | |
|  | 1 | 1 |  | x | = | 4 |
|  | 3 | y |  | 1 |  | 1 |

.

1. 2 

##### C. 16 + 2 

**R**



**60O**

**50O**

**Q**

**T**

1. 8 + 2
2. 16 + 16 
   1. x = -3, y = 3 B. x = 8, y = 3

C. x = 3, y = -8 D. x = 8, y = -3

**P**

In the diagram above, PTS is a tangent to the circle TQR at T. calculate < RTS.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | A. | 1200 | B. | 700 |
| 25. | The determinant of the matrix | | | |  | C. | 600 | D. | 400 |
|  |  | (1 | 2 | 3) |  |  |  |  |  |
|  |  | (4 | 5 | 6) | is | 32. |  |  |  |
|  |  | (2 | 0 | -1) |  |  | **6 cm h 5 cm** | | |
|  | A. | -67 |  | B. | -57 |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| C. | -3 | D. | 3 | **7 cm** |

33.

In the diagram above, find h.

A. 12/ cm B. 12/ V6cm



**C**

**A**

**3**

**4**

**43.2O 64.8O**

**F**

**72O A**

**2**

**144O**

**A**

**1**

C. 7/ 7cm D. 1/ V7 51cm 43.

12 2

***h***



In the frustum of a cone shown above, the top diameter

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| is twice the bottom diameter. If the height of the frustum | A. | 52.0 |  | B. | 43.2 |  |
| is h centimeters, find the height of the cone.  A. 2h B. 2h  C. h D. h/2 44. | C. | 40.0 |  | D. | 12.0 |  |
|  | ***x*** | **1** | **2** | **3** | **4** | **5** |
| What is the locus of a point P which moves on one side of a straight line XY, so that the angle XPY is always | ***f*** | **2** | **1** | **2** | **1** | **2** |

The grades A1, A2, A3, C4 and F earned by students in a particular course are shown in the pie chart above. What percentage of the students obtained a C4 grade?

equal to 900

* 1. The perpendicular B. Aright-angled triangle. bisector of XYX

C. A circle D. A semi-circle.

The table above shows the frequency distribution of a data. If the mean is 43/14, find y.

##### A. 1 B. 2

##### C. 3 D. 4

1. If M(4,q) is the mid-point of the line joining L(p, -2) and N(q, p), find the values of p and q.
   1. p = 2, q = 4 B. p = 3, q = 1

C. p = 5, q = 3 D. p = 6, q = 2

1. ***y***

**(0,4)**

**(0,0)**

**(3,0)**

***x***

1. The angle of depression of a boat from the top of a cliff 10m high is 300. how far is the boat from the foot of the cliff?
2. The mean of twelve positive numbers is 3. when another number is added, the mean becomes 5. find the thirteenth number.

##### 29 B. 26

##### C. 25 D. 24

1. Find the mean deviation of the set of numbers 4, 5, 9

##### A 0 B. 2

##### C. 5 D. 6

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Class interva Frequency** | **1-5**  **6** | **6-10**  **15** | **11-15**  **20** | **16-20**  **7** | **21-25**  **2** |

Estimate the median of the frequency distribution above.

1. 53/ m B. 53m
2. 101/
3. 111/

3 2 2

1. 103m D. 103/ m

3

2

1. What is the value of sin (-6900)?

48.

##### C. 121/

##### D. 13

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***x*** | **1** | **2** | **3 4** | **5** |
| ***f*** | ***y* + 2** | ***y* - 1** | **2*y* + 3 *y* + 4** | **3*y* - 4** |

|  |  |  |  |
| --- | --- | --- | --- |
| A.  C. | 3/2  -1/2 | B.  D. | -3/2  ½ |
| If y = 3t3 + 2t2 – 7t + 3, find dy/ at t = -1  dt | | | |
| A. | -1 | B. | 1 |
| C. | -2 | D. | 2 |

Find the variance of the frequency distribution above

##### 3/ B. 9/

2 4

C. 5/ D. 3

2

1. Find the point (x, y) on the Euclidean plane where

the curve y = 2x2 – 2x + 3 has 2 as gradient.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | (1,3) | B. | (2,7) |
| C. | (0,3) | D. | (3,15) |

1. Integrate (1 – x)/x3 with respect to x.
   1. (x – x2)/(x4 + k) B. 4/x4 – 3/x3 + k

C. 1/x – 1/2x2 + k D. 1/3x3 – 1/2x + k

|  |  |  |  |
| --- | --- | --- | --- |
| **Age in years** | **10** | **11** | **12** |
| **Number of pupils** | **6** | **27** | **7** |

The table above shows the number of pupils in each age group in a class. What is the probability that a pupil chosen at random is at least 11 years old?

1. Evaluate 1 (2x + 1)2 dx

-1

1. 27/

##### C. 33/40

1. 17/
2. 3/ 20
   1. 32/

3

##### C. 41/

* 1. 4

##### D. 42/

40 20

3 3

1. In a survey, it was observed that 20 students read newspapers and 35 read novels. If 40 of the students

probability of the students who read both newspapers and novel?

read either newspaper or novels, what is the A. 1/

2

##### C 3/

1. 2/

##### D. 3/

3

8 11

# Mathematics 1995

1. Calculate 33105- 1442 5

##### A. 13135 B. 21135 C. 43025 D. 11035

1. Convert 3.1415926 to 5 decimal places

##### A. 3.14160 B. 3.14159 C. 0.31415 D. 3.14200

1. The length of a notebook 15cm, was measured as

16.8cm. calculate the percentage error to 2 significant figures.

##### A. 12.00% B. 11.00% C. 10.71% D. 0.12%

1. A worker’s present salary is #24,000 per annum. His annual increment is 10% of his basic salary. What would be his annual salary at the beginning ofthe third year?

##### A. #28,800 B. #29,040 C. #31,200 D.#31,944

1. Express the product of 0.0014 and 0.011 in standard form.

A. 1.54 x 102 B. 1.54 x 10-3 C. 1.54 x 104 D. 1.54 x 10-5

1. Evaluate (813/4 - 27 1/3)

3 x 23

A. 27 B. 1 C. 1/3 D. 1/8

* 1. (-6, 0)(-1, 0) B. (-3,0)(-2,0)

C. (-6,0)(1, 0) D. (2, 0)(3, 0)

1. Factorize completely the expression

abx2 + 6y – 3ax –2byx

* 1. (ax – 2y)(bx - 3) B. (bx + 3)(2y - ax)

C. (bx + 3)(ax – 2y) D. (ax – 2y) (ax - b)

1. Solve the following inequality (x - 3)(x - 4) 0
   1. 3 x  4 B. 3 < x < 4

C. 3  x < 4 D. 3 < x 4

1. The 4th term of an A. P is 13cm while the 10th term is 31. find the 31st term.

##### 175 B. 85

C. 64 D. 45

1. Simplify x2 - 1

x3 + 2x2 – x - 2

* 1. 1/x + 2 B. x – 1/x + 1

C. x – 1/x + 2 D. 1/x – 2

1. Express 5x – ½ (x - 2)(x - 3) in partial fraction
   1. 2/x – 2 – 3/x – 3 B. 2/x – 2 + 3/x – 3
2. Find the value of (16)3/2 + log 0.0001 + log 32 C. 2/x – 3 – 3x –2 D. 5/x – 3 + 4/x – 2

10 2

##### A. 0.065 B. 0.650 C. 6.500 D. 65.00

***y***

**-1**

**0**

**1**

**2 *x***

1. Simplify 12 - 3

12 + 3

##### A. 1/3 B. 0 C. 9/15 D. 1

1. Four members of a school first eleven cricket team are also members of the first fourteen rugby team. How many boys play for at least one of the two teams?

##### A. 25 B. 21 C. 16 D. 3

1. If S = (x : x2 = 9, x > 4), then S is equal to

A. 0 B. {0} C. f D. {f}

1. If x – 1 and x + 1 are both factors of the equation x3 + px3 + qx + 6 = 0, evaluate p and q

##### A. –6, -1 B. 6, 1 C. -1 D. 6, -6

1. 12.

Find a positive value of p if the equation 2x2 – px + p leaves a remainder 6 when added

##### B. 2 C. 3 D. 4

1. Find r in terms of K, Q and S if s = 2r Q
   1. r2 - k B. r2 - k 2r2Q Q 4r2Q

C. r2 - k D. r2 - k 2r2Q 4r2Q

1. The graph of f(x) = x2 - 5x + 6 crosses the x-axis at the points

Use the graph of the curve y = f(x) above to solve the inequality f(x) > 0.

* 1. -1 x  1, x > 2 B. x -1, 1, < x > 2

C. x -1, 1  x  2 D. x  2, -1  x  1

1. Which of the following binary operation is commutative in a set of integers?
   1. a\*b = a + 2b B. a\*b = a + b –ab

C. a\*b = a2 + b D. a\*b = a(b + 1)/2

1. If a\*b = +ab, Evaluate 2\*(12\*27)

##### 12 B. 9

##### C. 6 D. 2

1. Find the sum to infinity of thefollowing sequence 1, 9/10, (9/10)2, (9/10)3

##### 1/10 B. 9/10

##### C. 10/9 D. 10

1. Find the value of K if 2, 1, 1

2, 1 k

1, 3 -1 = 23

##### 1 B. 2

33.

**12 cm**

**14 cm**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 25. | If X = | 1, 2 | and Y | = | 2, | 1 |
|  |  | 0, 3 |  |  | 4, | 3 |

26.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A. | (10, 7) | | B. | (2, 7) |
|  | (12, 9) | |  | (1, 17) |
| C. | (10, | 4) | D. | (4, 3) |
|  | ( 4, | 6) |  | (10, 9) |

In the diagram above, the base diameters is 14cm while the height is 12cm. Calculate the total surface area if the cylinder has both a base and a top (p = 22/7)

27.

Determine the value of x in the figureabove

A. 1340 B. 810



**81O**

***x***

**53O**

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 836cm2 | B. | 528cm2 |
| C. | 308cm2  **Q** | D. | 154cm2 |

C. 530 D. 460

### Z



**X**

**Y**

**P T**

34.

**30O**



**P 10 cm R**

In the diagram above, find PQ if the area of triangle PQR is 35ccm2

A. 97cm B. 10cm

C. 14cm D. 17cm

PT is a tangent to the circle TYZX, YT = YX and < PTX = 500. calculate <TZY

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 500 | B. | 650 |
| C. | 850 | D. | 1300 |

1. In a triangle XYZ, <YXZ = 440? and <XYZ = 1120. calculate the acute angle between the internal triangle of <XYZ and<XZY.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 420 | B. | 560 |
| C. | 680 | D. | 780 |

1. Find the distance between two towns P(450N, 300N) and Q(150S, 300W) if the radius of the earth is 7 000km.

##### 1 100 B. 2 200

3 3

##### C. 11 000

3

1. Two perpendicular lines PQ and QR intersect at (1, -1). If the equation of PQ is x – 2y + 4 = 0, find the equation of QR.
   1. x – 2y + 1 = 0 B. 2x + y – 3 – 0

C. x – 2y – 3 = 0 D. 2x + y – 1 = 0

1. P is on the locus of a point equidistant form two given points X and Y. UV is a straight line through Y parallel to the locus. If < PYU is 400 find <XPY

##### 1000 B. 800

C. 500 D. 400



**117O**

**k**

**m**

**n**

***x*O**

In the diagram above, k, m, and n are parallel lines. What is the value of the angle marked x?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A. | 370 | B. | 630 |  |
| C. | 1170 |  | D. | 1530 |

1. A schoolboy lying on the ground 30m away from the foot of a water tank lower observes that the angle of elevation of the top of the tank is 600. Calculate the height of the water tank.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 60m | B. | 30.3m |
| C. | 20.3m | D. | 10.3m |

1. QRS is a triangle with QS = 12m, <RQS = 300 and

<QRS = 450, calculate the length of RS.

* 1. 182m B. 122m

C. 62m D. 32m

1. Which of the following is a sketch of y = 3 sin x?



**3**

B.

**0**

**2 2**

**3**

##### A.



**0**

**2**

**2**

**3**

**3**

**0**

**2**

**2**

**3**

C.



D.

**3**

**0**

**2**

**2**

**3**

1. The derivative of cosec x is

|  |  |  |  |
| --- | --- | --- | --- |
| A. | tan x cosec x | B. | – cot x cosec x |
| C. | tan x sec x | D. | –cot x sec x |

1. For what value of x is the tangent o the curve y = x2 – 4x + 3 parallel to the x – axis?

##### 3 B. 2

C. 1 D. 0

1. Two variables x and y are such that dy/dx = 4x – 3 and y

= 5 when x = 2. find y in terms of x

A. 2x2 – 3x+ 5 B. 2x2 – 3x + 3 C. 2x2 – 3x D. 4

1. Find the area bounded by the curve y = 3x2 – 2x + 1, the coordinates x = 1 and y = 3 and the x-axis

##### A. 24 9. B. 22 47 C. 21 D. 20

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Age in years 13** | **14** | **15** | **16** | **17** |
| **No . of students 3** | **10** | **30** | **42** | **15** |

1. The variance of the scores 1,2,3,4,5 is

##### A. 1.2 B. 1.4 C. 2.0 D. 3.0

The frequency distribution above shows the ages of students in a secondaryschool. In a pie chart constructed to represent the data, the angle corresponding to the 15 years-old is

A. 270 B. 300 C. 540 D. 1080



**Economics History**

**150O**

**O**

**French**

**C. R. K.**

**Use the table below to answer questions 47 and 48**

The pie chart above shows the distribution of students in a secondary school class. If 30 students offered French, how many offered C.R.K?

##### A. 25 B. 15 C. 10 D. 8

1. The mean and the range of the set of numbers 0.20,1.00,0.90,1.40,0.80,0.80,1.20,and 1.10

are m and r respectively. Find m + r

##### A. 1.11 B. 1.65 C. 1.85 D. 2.45

|  |  |  |
| --- | --- | --- |
| **Class 1 - 3** | **4 - 6** | **7 - 9** |
| **Frequency 5** | **8** | **5** |

Find the standard deviation of the data using the table above

##### A .5 B. 6 C. 5/3 D. 5

1. find the mode of the distribution

|  |  |  |  |
| --- | --- | --- | --- |
| **Class Interval** | **Frequency** | **Class Boudaries** | **Class Mid-poin** |
| **1.5-1.9** | **2** | **1.45-1.95** | **1.7** |
| **2.0-2.4** | **1** | **1.95-2.45** | **2.2** |
| **2.5-2.9** | **4** | **2.45-2.95** | **2.7** |
| **3.0-3.4** | **15** | **2.95-3.45** | **3.2** |
| **3.5-3.9** | **10** | **3.45-3.95** | **3.7** |
| **4.0-4.4** | **5** | **3.95-4.45** | **4.2** |
| **4.5-4.9** | **3** | **4.45-4.95** | **4.7** |

##### A. 3.2 B. 3.4 C. 3.7 D. 4.2

1. The median of the distributionis

##### A. 4.0 B. 3.5 C. 3.2 D. 3.0

1. Let P be a probability function on set S, where S = (a1,a2,a3,a4) find P(a1) if P(a2) = P(a3) = 1/6 and P(a4)1/5

##### 7/10 B 2/3 C. 1/3 D. 3/10

1. A die has four of its faces coloured while and the remaining two coloured black . What is the probability that when the die is thrown two consecutive times, the top face will be white in both cases?

A. 2/3 B. 1/9 C. 4/9 D. 1/36

# Mathematics 1997

1. If (1PO3) = 115 , find P

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 19 + 4"15/11 | B. | 19 + 4"15/19 |
| C. | 19 + 2"15/11 | D. | 19 + 2"15/19 |

4

* 1. 0

10

* 1. 1

##### 2 D. 3

1. Evaluate 64.7642 – 35.2362 correct to 3 significant figures

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 2960 | B | 2950 |
| C. | 2860 | D. | 2850 |

1. Find the value of (0.006) 3 + (0.004) 3 in standard form.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 2.8 X 10-9 | B | 2.8 X 10-8 |
| C. | 2.8 X 10-7 | D. | 2.8 X 10-6 |

1. Given that loga2 = 0.693 and loga3 = 1.097, find loga13.5

##### 1.404 B. 1.790

C. 2.598 D. 2.790

1. Simplify log 296 – 2log 62
   1. 2 - log 3 B. 3 – log 3

2 2

C. log23 – 3 D. log23 – 2

1. If 8x/2= [23/8][43/4], find x

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3/8 | B. | ¾ |
| C. | 4/5 | D. | 5/4 |

1. Simplify (23+35)/(35 - 23)
2. Find the simple interest rate per cent per annum at which #1000 accumulates to #1240 in 3 years.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 6% | B. | 8% |
| C. | 10% | D. | 12% |

9 If U = {S,P,L,E,N,D,O,U,R} X = {S,P,E,N,D}

##### Y = {P,N,O,U,R}

Find X(Y’UZ).

##### A. {P,O,U,R} B. {S,P,D,R}

C. {P,N,D} D. {N,D,U}

1. A survey of 100 students in an institution shows that 80 students speak Hausa and 20 students Igbo, while

only 9 students speaks both languages. How many students neither Hausa nor Igbo?

##### 0 B. 9

C. 11 D. 20

1. If the function (x) = x3 + 2x2 + qx – 6 is divisible by x + 1, find q.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -5 | B. | -2 |
| C. | 2 | D. | 5 |

1. Solve the simultaneous equations

/ 2 – 3/ = 2, 4/ + 3/ = 10 24. Find the non-zero positive value of x which satisfies

x y x y

* 1. x = 3/ , y = ½ B. x = ½, y = 3/ the equation

2 2

C. x = -1/ , y = -3/ D. x = ½, y = - 3/

2 2 2

x 1 0

1. Find the minimum value of x2 – 3x + 2 for all real values of x.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 0 | 1 x |  | |
| A. | 2 |  | B. | 3 |
| C. | 2 |  | D. | 1 |

1 x 1 = 0

##### -1/ B. -1/

2

4

C. ¼ D. ½

1. Make f the subject of the formula

*v*

1 + 1

*f g*

t =

* 1. gv – t2/gt2 B. gt2/gv – t2

C. v/t1/2 - 1/g D. gv/t2 – g

1. What value of g will make the expression 4x2 – 18xy – g a perfect square?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 9 | B. | 9y2/4 |
| C. | 81y2 | D. | 81y2/4 |

1. Find the value of K if 5+2r/ expressed in partial

(r+1)(r-2)

25. Each of the base angles of an isosceles triangle is 580 and all the vertices of the triangle lie on a circle. Determine the angle which the base of the triangle subtends at the centre of thecircle.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1280 | B. | 1160 |
| C. | 640 | D. | 580 |

26.



**F**

**34O**

***x***

**K**

**47O**

**H**

**G**

fraction is K/r-2 + L/

r+1

, where K and L are constants. **R**

##### A. 3 B. 2

##### C. 1 D. -1

1. Let f(x) = 2x + 4 and g(x) = 6x + 7 where g(x) > 0.

From the figure above, FK//GR and FH = GH,< RFK

= 340 and < FGH = 470. calculate the angle marked x.

solve the inequality f(x)/ g(x) < 1 A. 420 B. 520

|  |  |  |  |
| --- | --- | --- | --- |
| A. | x < - ¾ | B. | x > - 4/3 |
| C. | x > - 3/4 | D. | x > - 12 |

##### C. 640 D. 720

1. Find the range of values of x which satisfies the inequality 12x2< x + 1

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -1/4 < x < 1/3 | B. | ¼ < x <1/3 |
| C. | -1/3 < x<1/4 | D. | -1/4 < x <-1/3 |

1. Sn is the sum of the first n terms of a series given by S = n2 – 1. find the nth term.

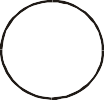
n

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 4n + 1 | B. | 4n – 1 |
| C. | 2n + 1 | D. | 2n – 1 |

1. The nth term of a sequence is given by 31-n. find the sum of the first three terms of thesequence.

D. / 0

27.



**25 cm**

**3 cm**

**X**

**2 cm**

**Y**

The figure above shows circles of radii 3cm and 2cm with centres at X and Y respectively. The circles have a transverse common tangent of length 25cm. Calculate XY.

* 1. 630 cm B. 626 cm

1. 615 cm D. 600 cm
   1. 13/

##### C. 1/ 9

B 11 28. A chord of a circle diameter 42cm subtends an angle

3 9 of 60 at the centre of the circle. Find the length of

the minor arc.

1. Two binary operations \* and Ä are defined as m\*n = mn – n – 1 and m Ä n = mn + n – 2 for all real numbers m, n. find the values of 3Ä (4\*5).

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 60 | B. | 57 |
| C. | 54 | D. | 42 |

1. If xy = x + y – xy, find x,

when (x\*2)+(x\*3) = 68

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 24 | B. | 22 |
| C. | -12 | D. | -21 |

* 1. 22 cm B. 44 cm

C. 110 cm D. 220 cm [ = 22/7]

1. An arc of a circle subtends an angle of 700 at the centre. If the radius of the circle is 6cm, calculate the area of the sector subtended by the given angle.
   1. 22 cm2 B. 44 cm2

C. 66 cm2 D. 88 cm2



1. Determines x + y if **5 cm 8 cm**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2  -1 | | -3  4 | (x)  (y) | = (-1)  (8) |
| A.  C. | 3 |  | B. 12 | 4 |
| 7 | D |  |

1. **cm**
2. **cm**

Find the volume of the prism above.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 990 cm3 | B. | 880cm3 | 41. Integrate 1/x + cos x with respect to x. | | | |
| C. | 550 cm3 | D. | 495cm3 | A.  C. | -1/x2 + sin x + k  1nx – sin x + k | B.  D. | 1nx+ sin x+ k  -1/x2 – sin x + k |

1. A cone with the sector angle of 450 is cut out of a circle of radius r cm. find the base radius of the cone.

42. If y = x(x4 + x2 + 1), evaluate 1 dyx

-1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | r/16cm | B. | r/8cm | A. | 11/12 | B. | 11/16 |
| C. | r/4cm | D. | r/2cm | C. | 5/6 | E. | 0 |

1. A point P moves so that it is equidistant from points L and M. if LM is 16cm, find the distance of P from LM when P is 10cm from L.
   1. 12cm B. 10cm

C. 8cm D. 6cm

1. The angle between the positive horizontal axis and a given line is 1350. find the equation of the line if it passes through the point (2, 3).
   1. x – y = 1 B. x + y = 1

C. x + y = 5 D x – y = 5

1. Find the distance between the point Q(4, 3) and the point common to the lines 2x – y = 4 and x + y = 2

##### B.



3 10

26



3 5

13

C. D.

43.

44.



**Housing**

**69O Basic**

Trans

**60**

**O**

port

**61O Others Meal**

**50O**

The pie chart above shows the income of a civil servant in a month. If his monthly income is #6000, find his monthly basic salary.

##### A. #2000 B. #2600

C. #3100 D. #3450



1. The angle of elevation of a building from a measuring instrument placed on the ground is 300. if the building is 40m high, how far is the instrument from the foot of the building?
   1. 203m B. 403m

C. 203m D. 403m

1. In a triangle XYZ, if <XYZ is 600, XY = 3cm and YZ = 4cm, calculate the length of the side XZ.

In an examination, the result of a certain school is as shown in the histogram above. How many candidates did the school present?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | “23cm | B. | “13cm | A. | 12 | B. | 16 |
| C. | 2"5cm | D. | 2"3cm | C. | 18 | D. | 19 |

## X



**5 cm**

**2 cm**

**Z**

**150O**

**Y E**

45.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Age 20** | **25** | **30 35** | **40** | **45** |
| **No . of students 3** | **5** | **1 1** | **2** | **3** |

Find the median age of the frequency distribution in the table above

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 20 | B. | 25 |
| C. | 30 | D. | 35 |

In the figure above, XYZ is a triangle with XY = 5cm, XZ = 2cm and XZ is produced to E making the angle YZE = 1500. if the angle XYZ = è, calculate the value of the sin è.

46 The following are the scores of ten students in a test of 20 marks; 15,16,17,13,16,8,5,16,19,17. what is the modal score?

##### 13 B. 15

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 3/5 | B. | ½ | C. | 16 | D. | 19 |
| C. | 2/5 | D. | 1/5 |  |  |  |  |

1. Differentiate 6x3-5x2+1

3x2

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 2 + 2/3x3 | B. | 2 + 1/6x | A. | 2 | B. | 3 |
| C. | 2-2/3x3 | D. | 2-1/6x | C. | 10 | D. | 11 |

1. Find the standard deviation of the following data - 5,-4,-3,-2,-1,0,1,2,3,4,5
2. d/dx cos(3x2 – 2x) is equal to
   1. -sin(6x- 2) B. -sin(3x2 –2x)

C. (6x- 2) sin(3x2 – 2x) D. (6x - 2) sin (3x2 – 2x)

1. Find the gradient of the curve y = 2 x – 1/x at the point x= 1

##### A. 0 B. 1 C. 2 D. 3

1. Find the difference between the range and the variance of the following set of numbers 4,9,6,3,2,8,10,5,6,7 where d2 = 60.

##### 2 B. 3

C. 4 D. 6

1. In a basket of fruits, there are 6 grapes, 11 bananas and 13 oranges. If one fruit is chosen at random, what is the probability that the fruit is either a grape or a banana?

##### 17/30 B. 11/30

C. 6/30 D. 5/30

1. A number is selected at random between 10 and 20, both numbers inclusive. Find the probability that the numbers is an even number.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 5/11 | B. | ½ |
| C. | 6/11 | D. | 7/10 |

**Mathematics 1998**

1. If 10112 + X7, = 2510, solve for X In the venn diagram above, the shaded region is

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 14 | B. | 20 | A. | (PÇQ)ÈR | B. | (PÇQ)ÇR |
| C. | 24 | D. | 25 | C. | (PÇQ’)ÇR | D. | (PÇQ’)ÇR |

1. Evaluate [1/0.03  1/0.024] -1, correct to 2 decimal places

##### 3.76 B. 1.25

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C. | 0.94 | D. | 0.75 | A. | 2, -1 | B. | -1, 2 |
|  |  |  |  | C. | 3, -2 | D. | -2, 3 |

1. When the expression pm2 + qm + 1 is divided by (m

- 1), it has a remainder 2 and when divided by (m + 1) the remainder is 4. find p and q respectively

1. If b3 = a-3 and c 1/3 = a1/2b, express in terms of aA. a-1/2 B. a1/2

C. a3/2 D. a-2/3

1. Given that Log (y - 1) + Log (1/2x) = 1 and Log

4 4 2

1) + log2x = 2, solve for x and y respectively

(y +

1. Factorize r2 – r (2p + q) + 2pq
   1. (r – 2q)(2r - p) B. (r - q)(r + p)

C. (r - q)(r – 2p) D. (2r - q)(r + p)

1. Solve the equation x - (x - 2) – 1 = 0

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 2, 3 | B. | 3, 2 | A. | 3/2 | B. | 2/3 |
| C. | -2, -3 | D. | -3, -2 | C. | 4/9 | D. | 9/4 |

1. Find the value of K if K/”3 + “2 = “3 - 2

##### 3 B. 2

C. “3 D. “2

1. A market woman sells oils in cylindrical tins 10cm deep and 6cm diameter at #15.00 each. If she bought a full cylindrical jug 18cm deep and 10cm in diameter for #50.00, how much did she make by selling all the oil?

##### #62.50 B. #35.00

C. #31.00 D. #25.00

1. A man is paid r naira per hour for normal work and double rate for overtime. If he does a 35-hour week which includes q hours of overtime, what is his weekly earning in naira?
   1. r(35 + q) B. q(35r - q)

C. q(35r + r) D. r(35r - q)

1. Given the universal set U = {1,2,3,4,5,6,} and the sets P = {1,2,3,4,} Q = {3,4,5} and R = {2,4,6}. Find PÈ(QÈR).
2. Find the range of values of m for which the roots of the equation 3x2 – 3mx + (m2 – m - 3) = 0
   1. -1<m<7 B. -2<m<6

C. -3<m<9 D. -4<m<8

1. Make a/x the subject of the formula

x + a/x – a = m

* 1. m – 1/m + 1 B. 1 + m/1 – m

C. 1-m/1 + m D. m + 1/m – 1

1. Divide 2x3 + 11x2 + 17x + 6 by 2x + 1
   1. x2 + 5x + 6 B. 2x2 + 5x + 6

C. 2x2 – 5x + 6 D. x2 – 5x + 6

1. Express in partial fractions

11x + 2 6x2 – x – 1

* 1. 1/3x– 1 + 3/2x+ 1 B. 3/3x+ 1 – 1/2x– 1

C. 3/3x– 1 – 1/2x+ 1 D. 1/3x+ 1 + 3/2x- 1

1. If x is a positive real number, find the range of values for which

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A.  C. | {4}  {1,2,3,5,6} | B.  D. | {1,2,3,4}  {1,2,3,4,5,6} | A. | x> - 1/6 | 1/3x + ½ > 1/4x  B. | x>0 |
|  |  |  |  | C. | 0<x<4 | D. | 0<x<1/6 |



**P**

**Q**

**R**

1. ***y***



**(0, 3)**

**(2, 0)**

***x***

The shaded area above represents

* 1. x0, 3y + 2x 6 B. x 0, y3, 3x + 2y 6

C. x 2, y 0, 3x + 2y6 D. x 0, y 0,3x + 2y6

1. If p + 1, 2p – 10 ,1 – 4p2 are the consecutive terms of an arithmetic progression, find the possible values of p.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | -4, 2 | B. | –2, 4/11 | C. | 700 | D. | 800 |
| C. | –11/4, 2 | D. | 5, -3 |  |  |  |  |

In the diagram above, PQ//ST and ÐPQR = 1200, ÐRST

= 1300. find the angle marked x.

##### A. 500 B. 650

1. The sum of the first three terms of a geometric progression is half its sum to infinity. Find the positive common ration of the progression.

##### ¼ B. ½

C. 1/3"3 D. 1/3"2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **O**x | **p** | **q** | **r** | **s** |
| **P**  **q r s** | **r**  **p** | **p q** | **r**  **r** | **p**  **s** |
| **r** | **r** | **r** | **r** |
| **q** | **s** | **r** | **q** |

27.



**P**

**Q**

**T**

**10cm**

**S 8cm**

**R**

In the figure above, PQST is a parallelogram and TSR is a straight line. If the area of QRS is 20cm2, find

the area of the trapezium PQRT.

2 2

A. 35cm B. 65cm

28.

C. 70cm2 D. 140cm2

### X



**32O**

**R**

**Y**

**40O**

The identity element with respect to the multiplication shown in the table above is

**A.** p B. q **T Q**

C. r D. s

1. The binary operation \* is defined by x\*y = xy – y – x for all real values x and y x\*3 = 2 \* x, find x.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | -1 | B. | 0 | C. | 1400 | D. | 1480 |
| C. | 1 | D. | 5 |  |  |  |  |

TQ is tangent to circle XYTR. YXT = 320,

RTQ = 400. find YTR.

##### A. 1080 B. 1210

1. The determinant of matrix

in terms of x is

* 1. -3x2 - 17 B.

C. 3x2 + 17 D.

x, 1, 0

1-x, 2, 3

1, 1+ x, 4

-3x2 + 9x – 1 3x2 – 9x + 5

1. A chord of a circle radius Ö3cm subtends an angle of 600 on the circumference of the circle. Find the length of the chord.
   1. 3/2 cm B. 3/2 cm

C. 3 cm D. 3 cm

1. A cylindrical drum of diameter 56 cm contains 123.2 litres of oil when full. Find the height of the drum in
2. Let I=

##### 1 0. P= 2 3 Q=

u, 4 + u

centimeters.

0 1 4 5 -2v, v

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 12.5 | B. | 25.0 |
| C. | 45.0 | D. | 50.0 |

be 2 x 2 matrices such that PQ=1. find (u,v)

A. (-5/2, -1) B. (-5/2, 3/2)

C. (–5/6,1) D. (5/2, 2/3)

### T



**35O**

**S 30O**

**R**

1. The locus of all points at a distance 8 cm from a point N passes through point T and S. if S is equidistant from T and N , find the area of triangle STN.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 43 cm2 | B. | 163 cm2 |
| C. | 32cm2 | D. | 64 cm2 |

**P** 32. If the distance between the points (x, 3) and (-x, 2)

**Q** is 5. find x

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 6.0 | B. | 2.5 |
| C. | 6 | D. | 3 |

In the diagram above, PR is a diameter of the circle PQRS. PST and QRT are straight lined. Find Ð QSR.

1. 200
2. 250
3. 300
4. 350

### R



#### x

**120O**

**130O**

33 The midpoint of the segment of the line y = 4x + 3 which lies between the x-axis and the y-axis is

|  |  |  |  |
| --- | --- | --- | --- |
| A. | (-3/2, 3/2) | B. | (-2/3, 3/2) |
| C. | (3/8, 3/2) | D. | (-3/8, 3/2) |

1. Solve the equation

cos x + sin x = 1/cos x – sinx for values of x such that 0  x < 2

* 1. /2, 3/2 B. /3, 2/3

C. 0, /3 D. 0, 

### P Q S T

### R



**P**

**10**

**15 8**

**30O**

**T**

**Q**

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 2/3 | B. | 1 |
| C. | K + 1 | D. | (K +1)2 |

1. Find the positive value of x if the standard deviation of the numbers 1, x +1, 2x + 1 is 6

In the diagram above, QTR is a straight line and PQT = 300. find the sine of PTR.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 8/15 | B. | 2/3 |
| C. | ¾ | D. | 15/16 |

1. For what value of x does 6 sin (2x - 25)0 attain its maximum value in the range 00 x  1800?
   1. [1 B. 2](#_TOC_250001)

[C. 3 D. 4](#_TOC_250000)

1. A bag contains 16red balls and 20blue balls only. How many white balls must be added to the bag so that the probability of randomly picking a red ball is equal to 2/5?
   1. 121/
   2. 321/

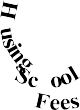
##### A. 4 B. 20

* 1. 57 /2
  2. 2

1471/

##### C. 24 D. 40

2 2



**120O**

**h**

1. From the top of a vertical mast 150m high, two huts on the same ground level are observed. One due east and the other due west of the mast. Their angles of depression are 600 and 450 respectively. Find the distance between the huts.

**o**

* 1. 150 (1 + 3)m B. 50 (3 + 3)m

C. 1503m D. 50/3m

1. If y = 243 (4x + 5)-2, find dy/dx when x = 1

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -8/3 | B. | 3/8 |
| C. | 9/8 | D. | –8/9 |
| Differentiate x/cos x with respect to x. | | | |
| A. | 1 + x sec x tan x | B. | 1 + sec2x |
| C. | cos x + x tan x | D. | secx + x secx tan x |

1. Evaluate  (sec2x – tan2x)dx

2

The pie chart above shows the monthly expenditure of a public servant. The monthly expenditure on housing is twice that of school fees. How much does the worker spend on housing if his monthly income is #7.200?

##### A #1000 B. #2000

C. #3000 D. #4000

|  |  |  |  |
| --- | --- | --- | --- |
| A. | /2 | B. |  - 2 |
| C. | /3 | D. |  + 2 |

1. Find the equation of the curve which passes through the point (2, 5) and whose gradient at any point is given by 6x - 5

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 6x2 – 5x + 5 | B. | 6x2 + 5x + 5 |
| C. | 3x2 – 5x – 5 | D. | 3x2 – 5x + 3 |

1. If m and n are the mean and median respectively of the set of numbers 2,3,9,7,6,7,8,5 and m + 2n to the nearest whole number.

##### 19 B. 18

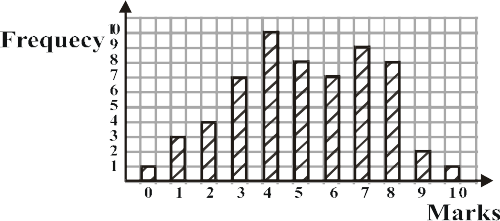
C. 13 D. 12

|  |  |  |  |
| --- | --- | --- | --- |
| **Average hourly earnings (N)** | **5 - 9** | **10 - 14 15 - 19** | **20 - 24** |
| **No . of workers** | **17** | **32 25** | **24** |

Estimate the mode of the above frequency distribution.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 12.2 | B. | 12.7 |
| C. | 12.9 | D. | 13.4 |

1. Find the variance of the numbers K, K + 1, K + 2.

The bar chart above shows the distribution of marks scored by 60 pupils in a test in which the maximum score was 10. if the pass mark was 5, what percentage of the pupils failed the test?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 59.4% | B. | 50.0% |
| C. | 41.7% | D. | 25.0% |

1. In a recent zonal championship games involving 10teams, teams X and Y were given Probabilities 2/ 5 and 1/3 respectively of wining the gold in the football event. What is the probability that either team will win the gold?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 2/15 | B. | 7/15 |
| C. | 11/15 | D. | 13/15 |

1. If x, y can take values from the set {1,2,3,4,}, find the probability that the product of x and y is not greater than 6.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 5/8 | B. | 5/16 |
| C. | ½ | D. | 3/8 |

# Mathematics 1999

1. If (a2b3c)/a-1b4c5

What is the value of P + 2q?

##### 5/2 B. –5/4

1. The first term of a geometrical progression is twice its common ratio. Find the sum of the first two terms of the progression if its sum to infinity is 8

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C. | –25/4 | D. | –10 | A. | 8/5 | B. | 8/3 |
|  |  |  |  | C. | 72/25 | D. | 56/9 |

1. Find the value of x if 2/(x + 2) = 1/(x - 2)

##### 32 + 4 B. 32 – 4

C. 3 - 22 D. 4 + 22

1. A trader bought 100 oranges at 5 for #1.20,20 oranges got spoilt and the remaining were sold at 4 for #1.50. find the percentage gain or loss
   1. 30% gain B. 25% gain

C. 30% loss D. 25% loss

1. If U = {1, 2, 3, 4, 5, 6}, P = {3, 4, 5}, Q = {2, 4, 6}

and R = {1, 2, 3 4}, list elements of (PÈQ’ÇR).

##### {1, 2, 3, 4, 5, 6} B. {1,2, 3, 4}

C. {1} D. Æ

1. Divide 24346 by 426
2. Tope bought x oranges at #5.00 each and some mangoes at #4.00 each. If she bought twice as many mangoes as oranges and spent at least #and at most #, find the range of the value ofx
   1. 4  x  5 B. 5  x  8

C. 5  x  10 D. 8  x  10

1. If m\*n = m/n – n/m, for m,n E R, evaluate –3 \*4

##### -25/12 B. –7/12

C. 7/12 D. 25/12

1. Find the matrix T if ST = I where S = (-1, 1)

(1, -2)

and I is the identity matrix.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A. | 23 | B. | 35 | A. | (-2, 1) | B. | (-2, -1) |
|  | C. | 6  526 | D. | 6  556 | | (-1, 1) |  | (-1, -1) |
|  | C. | | | | | (-1, -1) | D. | (-1, -1) |
| 6. | If 29x (Y3) =9 3 (Y53) , fin9d the value of Y | | | | | (01, -1) |  | (0, 1) |

##### 4 B. 3

##### C. 2 D. 1

1. Simplify 0.0023 x 750)/(0.00345) x 1.25

##### 15 B. 20

##### C. 40 D. 75

1. If log 10 = x, evaluate log 5 in terms ofx.

8 8

1. Divide 4x3 – 3x + 1 by 2x - 1
   1. 2x2 – x + 1 B. 2x2 – x – 1

C. 2x2 + x + 1 D. 2x2 + x - 1

1. Three consecutive positive integers k, l and m are such that l2 = 3(k + m). find the value of m.

##### 4 B. 5

1. 1/ x B. x – 1/4 C. 6 D. 7



***y***

**45O**

**-1**

**0**

**1**

***x***

2

C. x – 1/ D. x – 1/

3 2

1. A group of market women sell at least one of yam, plantain and maize. 12 of them sell maize, 10 sell yam and 14 sell plantain. 5 sell plantain and maize, 4 sell yam and maize, 2 sell yam and plantain only while 3 sell all the three items. How many women are in the group?

The shaded portion in the graph above is represented by

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A. | | 25 | B. | 19 | A. | | | y + x – x3 0, y – x £ 0 B. y - + x 3 ³ 0, y– x £ 0 | |
| C. | | 18 | D. | 17 | C. | | | y + x – x3 £ 0, y+ x ³ 0 D. y – x + x3 £ 0, y+ x £ 0 | |
| 10. | Given that Q = (6, 0) | | and | Q + P = (7, | 2) | 19. | Factorize completely | |  |
|  | (4, 5)  evaluate /Q + 2P/  A. 90 | | B. | (6,  96 | 8) |  | x2 + 2xy + y2 + 3x + 3y – 18  A. (x + y + 6)(x + y- 3) B.  C. (x - y+ 6)(x - y - 3) | | (x - y- 6)(x - y + 3) |
|  | C. 102 | | D. | 120 |  |  |  | |  |

1. A binary operation \* is defined by a\*b = ab + b for any real number a and b. if the identity element is zero, find the inverse of 2 under this operation

##### 2/3 B. ½

C. –1/2 D. 56/9

1. The sum of two members is twice their difference. If

the difference of the numbers is P, find the larger of the two numbers.

* 1. p/2 B. 3p/2

C. 5p/2 D. 3p

1. Express 1/x3 - 1

##### B.

C. D.

1. In  MNO, MN = 6 units, MO = 4 units and NO – 12 units. If the bisector of angle M meets NO at P, calculate NP.

30. From the Point P, the bearings of two points Q and R are N670W and N230E respectively. If the bearing of R from Q is N680E and PQ = 150m, calculate PR.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 4.8 units | B. | 7.2 units | A. | 120m | B. | 140m |
| C. | 8.0 units | D. | 18.0 units | C. | 150m | D. | 160m |

1. Find the equation of the locus of a point P(x, y ) such that PV = PW, where V = (1, 1) and W = (3, 5)
   1. 2x + 2y = 9 B. 2x + 3y = 8

C. 2x + y = 9 D. x + 2y = 8

1. **cm**
2. **cm**

**6 cm**

31.



**P**

**T**

***x***

**Q**

**S 110O**

**R**

In the figure above, PQRS is a circle with ST//RQ. Find the value of x if PT = PS

##### 700 B. 550

C. 400 D. 350

Find the value of l in the frustum above.

* 1. 5cm B. 6cm

C. 7cm D. 8cm

**X**



**2m**

**120cm**

##### 32. **E**

**F**



**34O**

**42O**

**H**

**G**

**Y 1cm Z**

In the diagrams above, EFGH is a cyclic quadrilateral in which EH//FG and FH are chords. If FHG = 420 and FH = 340, calculate HEG

Find the length XZ in the triangle above 33. If the maximum value of y = 1+ hx – 3x2is 13, find h.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 340 | B. | 420 |
| C. | 520 | D. | 760 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 7m | B. | 6m | A. | 13 | B. | 12 |
| C. | 5m | D. | 3m | C. | 11 | D. | 10 |

1. Find a positive value of a if the coordinate of the centre of a circle x2 + y2 – 2ax + 4y - a = 0 is (a, -2) and the radius is 4 units

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 1 | B. | 2 | C. | 3  9 | D. | 11 |
| C. | 3 | D. | 4 |  |  |  |  |

1. Evaluate 1

–2

* 1. -31/

(x - 1) 2

1. 7
2. A man 1.7m tall observes a bird on top of a tree at an angle of 300. if the distance between the man’s head and the bird is 25m, what is the height of the tree?
   1. 26.7m B. 14.2m

C. (1.7 +253m)/3 D. (1.7 +252m)/2

1. Evaluate /4 (x -1)2dx

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 2 + 1 | B. | 2 - 1 |
| C. | -2 - 1 | D. | 1 - 2 |

1. Find the area bounded by the curve

**O**

**T**

**9**

**P**

***x***

**Z**

**6**

y = x(2 - x), the x-axis, x = 0 and x = 2

A. 4 sq units B. 2squnits

C. 11/ sq units D. 1/3sq units

2

1. If y = 3x2 (x3 + 1)1/2find dy/dx
   1. 6x(x3+1) + 3x2/2(x3+1)1/2 B. 12x(x3+1)+ 3x2/2(x3+1)1/2

In the figure above, TZ is tangent to the circle QPZ. Find x if TZ = 6 units and PQ = 9 units.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3 | B. | 4 |
| C. | 5 | D. | 6 |

1. Find the tangent of the acute angle between the lines 2x

+ y =3 and 3x – 2y = 5

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -7/4 | B. | 7/8 |
| C. | 7/4 | D. | 7/2 |

C.(15x4+ 6x)/6x2(x3+1)1/2 D. 12x(x3+1) + 9x4/2(x3+1)1/2

1. Find the volume of solid generated when the area enclosed by y = 0, y = 2x and 3 is rotated about the x – axis.
   1. 81cubic units B. 36cubic units

C. 18cubic units D. 9 cubicunits

1. What is the derivative of t2sin (3t - 5) with respects to the variable?
   1. 6t cos (3t - 5) B. 2dt sin (3t - 5) – 3t2 cos(3t- 5)
2. 2t sin (3t- 5) + 3t2cos(3t- 5)
3. 2t sin (3t- 5) + t2 cos 3t
4. Find the value of x for which the function y = x3 – x has a minimum value.

##### -3 B. -3/2

C. 3/3 D. 3

1. Three boys play a game a luck in which their respective chances of wining are ½, 1/3 and ¼. What is the probability that one and only of the boys wins the game?

##### 1/24 B. 1/12

47.

The grades of 36 students in a class test are as shown in the pie chart above. How many students had excellent?

##### A. 7 B. 8

##### C. 9 D. 12

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No of students 2** | **2** | **11** | **10 16** | **51** | **40** | **10 25** | **15** | **20** |
| **Marks 0** | **1** | **2** | **3 4** | **5** | **6** | **7 8** | **9** | **10** |

The marks scored by students in a test are given in the above. Find the median.

##### A. 7 B. 6

##### C. 5 D. 4

##### C. 11/24 D. 23/24

1. A number is selected at random from 0 to 20. what is the probability that the number is an odd prime?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 8/21 | B. | 1/3 | A. | 24.8 | B. | 41.2 |
| C. | 2/7 | D. | 5/21 | C. | 49.4 | D. | 65.8 |

48. A student calculated the mean of 5 numbers as 45, 3. while rechecking his working, he discovered that his total was short by 20.5. what is the correct mean of the 5 numbers?

1. If 6C /6P/ = 1/6, find the valueof r. 49. The sectorial allocations to various ministries in a state

r r

##### 1 B. 3

##### C. 5 D. 6

1. If the standard deviation of the set of numbers 3, 6, x, 7, 5, is 2, find the least possible value of x.

##### 2 B. 3

##### C. 4 D. 6

budget are as follows:

Agriculture - #25 000000.00

Education - #20 000 000 .00

Women affairs - #35 000 000.00 Commerce and

Industries - #20 000000.00

In a pie chart to represent this information the corresponding angle to agriculture is

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 45. How many two digit numbers can be formed from the | | | | A. | 250 | B. | 450 |
| digits 0, 1, 2, if a digit can be repeated and no number | | | | C. | 500 | D. | 900 |
| may begin with 0 | | | | | | | |
| A. | 4 | B. | 12 | 50. The mean of four numbers is 5 and the mean deviation | | | |
| C. | 16 | D. | 20 | is 3. find the fourth number if the mean deviation of the | | | |
|  |  |  |  | first three numbers is 2. | |  |  |
| 46. |  |  |  | A. 6 B. 10 | | | |
|  |  |  |  | C. 11 D. 17 | | | |

# Mathematics 2000

##### C. –2/5, 1 D. 2, 3/5

1. Let P = {1,2,u,v,w,x}

R = {2,3,u,v,w,5,6,y}

and R = (2,3,4,v,x,y) Determine (P - Q)  R.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | {1, x} | B. | {x, y} |
| C. | {x} | D. |  |

1. If the population of a town was 240000 in January 1998 and it increased by 2% each year, what would be the population of the town in January 2000?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 480 000 | B. | 249 696 |
| C. | 249 600 | D. | 244 800 |

1. If 23 - 2/3 + 22 = m + n6,

Find the values of m and n respectively

##### 1, -2 B. –2, 1

1. In a youth club with 94 members, 60 like modern music and 50 like like traditional music. The number of members who like both traditional and modern music is three times who do not like any type of music. How many members like only one type of music?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 8 | B. | 24 |
| C. | 62 | D. | 86 |

1. Evaluate (2.813 x 10-3) x 1.063

5.637 x 10-2

reducing each number to two significant figures and leaving your answers in two significant figures.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 0.056 | B. | 0.055 |
| C. | 0.054 | D. | 0.54 |

1. A man wishes to keep some money in a savings deposit at 25% compound interest so that after 3 years he can buy a car for #150,000. how much does

**3**



**3**

**2**

**1**

**-3 -2 -1- 0 1 2 3**

**1**

**-2**

**-3**

* 1. **2** B.

**1**

**0**

he need to deposit now? **-3 -2 -1 -1**

**-2**

|  |  |  |  |
| --- | --- | --- | --- |
| A. | #112,000.50. | B. | #96,000.00 |
| C. | #85,714.28 | D. | #76,800.00 |

**-3**

**1 2 3**

1. If 314 – 256 = 340 , find x



C.

**3**

**2**

**1**

**-3 -2 -1 0 1 2 3**

**-1**

**-2**

**-3**



D.

**3**

**2**

**1**

**-3 -2 -1- 0 1 2 3**

**-2**

**-3**

10 7 x

* 1. 2n + 1 B. 2n – 1

##### C. 4 D. ¼

1. Audu bought an article for #50 000 and sold it to Femi at a loss of x%. Femi later sold the article to Oche at a profit of 40%. If Femi made a profit of

#10,000, find the value ofx. 18. Find the values of t for which the determinant of the

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 60 | B. | 50 | matrix | (t -4 | 0 | 0 ) |
| C. | 40 | D. | 20 |  | (-1 | t+t | 1 ) is zero |
|  |  |  |  |  | ( 3 | 4 | t-2) |

1. Simplify 3(2n + 1) – 4(2n -1 )/2(n + 1) – 2n
   1. 2n + 1 B. 2n - 1

##### C. 4 D. ¼

1. If P3446 – 23P26 = 2PP26, find the value of digit P.

##### 2 B. 3

##### 0, 2, 3 B. –4, 2, 3

C. –4, -2, -3 D. 4, -2, 3

19. If (x - 1), (x + 1) and (x - 2) are factors of the polynomial ax3 + bx2 + cx – 1, find a, b, c, respectively

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C. | 4 | D. | 5 | A. | -1/2, 1, ½ | B. | ½, 1, ½ |
|  | | |  | C. | ½, 1, -1/2 | D. | ½, -1, ½ |
| Evaluate 5-3log52 x 22log23 | | |  |  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A. | 8 | B. | 11/ | 20. A trader realizes 10x –x2naira profit from the saleof |
| C. | 2/5 | D. | 1/8 | x bags of corn. How many bags will give him the  maximum profit? |

8

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12. A binary operation \* is defined by a \* b = ab. if a \* 2 | | | |  | A. | 4 | | B. | 5 |
| = 2 –a, find the possible values of a. | | | |  | C. | 6 | | D. | 7 |
| A. 1, -1 B. 1, 2 | | | |  |  |  | |  |  |
| C. 2, -2 D. 1, -2 | | | | 21. | Solve | the inequality 2 – x | | > x2 |  |
|  | | | |  | A. | x < -2 or x > 1 | | B. | x > 2 or x < -1 |
| 13. The 3rd term of an A. P. is 4x – 2y and the 9th term is | | | |  | C. | –1 < x> 2 | | D. | –2 < x < 1 |
| 10x - 8y . find the common difference. | | | |  |  |  | |  |  |
| A.  C. | 19x - 17y  x – y | B.  D. | 8x - 4y  2x | 22. | If a and b are the roots of the equation 3x2 + 5x – 2 =  0, find the value of 1/ + 1/ | | | | |
|  | | | |  | A. | | -5/2 | B. | –2/3 |
| 14. Find the inverse of p under the binary operation \* by | | | |  | C. | | ½ | D. | 5/2 |
| p \* q= p + q – pq, where p and q are real numbers  and zero is theidentity. | | | | 23. | Find the | | minimum value | of the | function f( ) = 2/3 – |
| A. p B. p – 1 | | | |  | cos for | | *    2. |  |  |
| C. p/p – 1 D. p/p+1 | | | |  | A. | | ½ | B. | 2/3 |
|  | | | |  | C. | | 1 | D. | 2 |
| (a, b) | | | |  |  | |  |  |  |
| 15. A matrix P(a, b) is such that PT= p, where 24. A frustum of a pyramid with square base has its upper  (c, d) and lower sections as squares of sizes 2m and 5m | | | | | | | | | |

PT is the transpose of P, if b = 1, then P is

##### (0, 1) B. (0, 1)

(1, 0) (-1, 0)

respectively and the distance between them 6m. find the height of the pyramid from which the frustum was obtained.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C. | (0, 1) | D. | (1, 1) | A. | 8.0m | B. | 8.4m |
|  | (1, 1) |  | (-1,0) | C. | 9.0m | D. | 10.0m |

1. Evaluate (1/2 – ¼ + 1/8 – 1/16 + …….) -1

##### 2/3 B. 0

C. –2/3 D. 1

1. P is a point on one side of the straight line UV and P moves in the same direction as UV. If the straight line ST is on the locus of P and  VUS = 500, find  UST.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 17. | The solution of the simultaneous inequalities 2x – 2 | A. | 3100 | B. | 1300 |
|  | £ y and 2y 2 £ x is represent by | C. | 800 | D. | 500 |

1. A ship sails a distance of 50km in the direction S50E and then sails a distance of 50km in the direction N400E. find the bearing of the ship from its original position.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | S900E | B. | N400E |
| C. | S950E | D. | N850E |

1. An equilateral triangle of side 3 cm is inscribed in a circle. Find the radius of the circle.
   1. 2/3cm B. 2cm

C. 1cm D. 3cm

1. 3y = 4x – 1 and Ky = x + 3 are equations of two straight lines. If the two lines are perpendicular to each other, find K

##### -4/3 B. –3/4



¾

**S**D.

**50O**

**P 30O**

**R**

34. ***y***

#### x



***y=* 16**

If the diagram above is the graph of y=x2, the shaded area is

A. 64squareunits B. 128/3squareunits

C. 64/3squareunits D. 32squareunits

##### C.

4/3 35. Find the value of (cos2 – 1/sin2 d

##### A.  B. /

0

1. -/

0

1. 

**Q**

In the diagram above, if  RPS = 500,  RPQ = 300 and PQ = QR, find the value of  PRS

1. If y = 2y cos 2x – sin 2x, find dy/dx when x = ë/4

|  |  |  |  |
| --- | --- | --- | --- |
| A. |  | B. | –  |
| C. | /2 | D. | – / |

1. A bowl is designed by revolving completely the area enclosed by y = x2 – 1, y= 0, y = 3 and x ³ 0 around the y-axis. What is the volume of this bowl?

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A. | | 800 | **F** B. | | | 700 | A. | | 7 cubicunits. B. | 15 /2cubic units |
| C. | | 600 | D. | | | 500 | C. | | 8 cubic units D. | 17 /2cubic units. |
| 30. | **E** | | **O** | **N** | **G** | 38. | | If the volume of a hemisphere is increasing at a steady  rate of 8 m3s-1, at what rate is its radius changing when it is 6m? | | |

### H

In the diagram above, EFGH is a circle center O. FH is a diameter and GE is a chord which meets FH at right angle at the point N. if NH = 8 cm and EG = 24 cm, calculate FH.

* 1. 16cm B. 20cm

C. 26cm D. 32cm

1. If P and Q are fixed points and X is a point which moves so that XP = XQ, the locus of X is
   1. astraight line B. acircle

C. thebisector  PXQ D. theperpendicular

bisector of PQ

1. In a regular polygon, each interior angle doubles its corresponding exterior angle. Find the number of sides of the polygon.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 87 | B. | 6 |
| C. | 4 | D. | 3 |

1. A predator moves in a circle of radius 2 centre (0, 0), while a prey moves along the line y = x. if 0 x 2, at which point(s) will they meet?
2. A function f(x) passes through the origin and its first derivative is 3x + 2. what is f(x)

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 2.50ms-1 | B. | 2.00ms-1 |
| C. | 0.25ms-1 | D. | 0.20ms-1 |

* 1. y = 3/2x2 + 2x B. y = 3/2 x2 + x

C. y = 3 x2 + x/2 D. y = 3 x2 + 2x

1. The expression ax2 + bx + c equals 5 at x = 1. if its derivative is 2x + 1, what are the values of a, b, c, respectively?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1, 3, 1 | B. | 1, 2, 1 |
| C. | 2, 1, 1 | D. | 1, 1, 3 |

1. X and Y are two events. The probability of X and Y is 0.7 and the probability of X is 0.4. If X and Y are independent, find the probability of Y.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 0.30 | B. | 0.50 |
| C. | 0.57 | D. | 1.80 |

1. If the mean of the numbers 0, x + 2, 3x + 6 and 4x + 8 is 4, find their mean deviation.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 0 | B. | 2 |
| C. | 3 | D. | 4 |

1. In how many ways can the word MATHEMATICS be arranged?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | (1, 1) only | B. | (1, 1) and (1, 2) | A. | 11!/9! 2! | B. | 11!/9! 2! 2! |
|  |  |  |  | C. | 11!/2! 2! 2! | D. | 11!/2! 2! |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |

A dice is rolled 240 times and the result depicted in the table above. If a pie chart is constructed to represent the data, the angle corresponding to 4 is

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 100 | B. | 160 |
| C. | 400 | D. | 600 |

The cumulative frequency curve above represents the ages of students in a school. Which are group do 70% of the students belong?

##### 15.5 – 18.5 B. 15.5 – 19.5

C. 16.5 – 19.5 D. 17.5 – 20.5

1. The variance of x, 2x, 3x 4x and 5x is
   1. x2 B. 2x2

C. x2 D. 3x

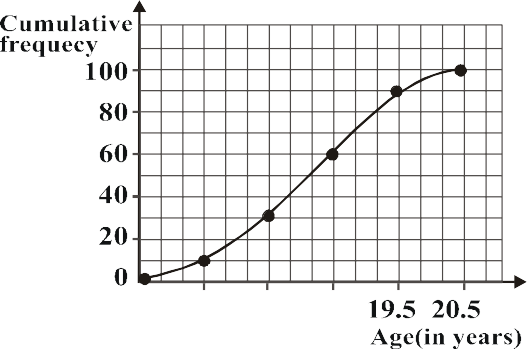
1. If U = {x : x is an integer and {1  x  20} E1 = {x : x is a multiple of 3}

E2 = {x : x is a multiple of 4}

And an integer is picked at random from U, find the probability that it is not in E2

##### ¾ B. 3/10

C. ¼ D. 1/20



1. Find the sum of the range and the mode of the set of numbers 10, 5, 10, 9, 8, 7, 7, 10, 8, 10, 8, 4, 6, 9, 10,

9, 10, 9, 7, 10, 6, 5

##### 16 B. 14

##### C. 12 D. 10

1. In how many ways can a delegation of 3 be chosen from among 5 men and 3 women, if at least one man at least one woman must be included?

##### 15 B. 28

##### C. 30 D. 45

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **No . Of Pupils** |  |  |  |

The table above shows the frequency distribution of the ages (in years) of pupils in a certain secondary school. What percentage of the total number of pupils is over 15 years but less than 21 years?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 35% | B. | 45% |
| C. | 50% | D. | 60% |

# Mathematics 2001

1. Find the principal which amounts to #5,000 at simple interest in 5 years at 2% per annum

##### #5000 B. #4900

C. #4800 D. #4700

1. A car dealer bought a second-hand car for #250,000.00 and spent #70 000.00 refurbishing it. He then sold the car for #400 000.00. what is the percentage gain?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 20% | B. | 25% |
| C. | 32% | D. | 60% |

1. Evaluate 21.05347 – 1.6324 x 0.43, to 3 decimal places.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 20.351 | B. | 20.352 |
| C. | 20.980 | D. | 20.981 |

1. Evaluate (0.14)2 x 0.275)/7(0.02) correct to 3 decimal places

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 0.033 | B. | 0.039 |
| C. | 0.308 | D. | 0.358 |

1. Given that p = 1 + 2 and q = 1 - 2, evaluate (p2 – q2)/2pq

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -2(2 + 2 ) | B. | 2(2 + 2) |
| C. | -22 | D. | 22 |

1. If y/2 = x, evaluate

(x3/y3 + 1/2) + (1/2 – x2/y2)

##### 5/16 B. 5/8

C. 5/4 D. 5/2

1. Simplify (364a3)-3
   1. 8a B. 4a

C. 1/4a D. 1/4a

1. Factorize 4x2 – 9y2 + 20x + 25
   1. (2x – 3y)(2x + 3y) B. (2x+ 5)(2x– 9y+ 5)
2. (2x– 3y + 5)(2x– 3y - 5)
3. (2x– 3y)(2x+ 3y+ 5)
4. If tow graphs y = px2 and y = 2x2 – 1 intersect at x = 2, find the value of p in terms of q
   1. (7 + q)/8 B. (8 – q)/2

C. (q – 8)/7 D. 7 / (q –1)

1. Solve the equations: m2 + n2 = 29;m + n = 7

|  |  |  |  |
| --- | --- | --- | --- |
| A. | (5, 2) and (5, 3) | B. | (5, 3) and (3, 5) |
| C. | (2, 3) and (3, 5) | D. | (2, 5) and (5, 2) |

1. Divide a3x – 26a2x + 156ax – 216 bya2x – 24ax + 108

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | ax – 18 | B. | ax – 6 | A. | 4 | B. | –2 |
| C. | ax – 2 | D. | ax + 2 | C. | –4 | D. | –12 |

13.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 12. Find the integral values of x and y satisfying the | | | | 20. | If P = | | 3 | -3 | 4 | then -2p is | |
| inequality 3y + 5x £ 15, given that y > 0, y< 3 and | | | |  |  |  | 5 | 0 | 6 |  |  |
| x > 0. |  |  |  |  |  |  | 1 | 2 | 1 |  |  |
| A. | (1, 1), (2, 1),(1, 3) | B. | (1, 1), (1, 2),(1, 3) |  |  |  | |  |  |  |  |
| C. | (1, 1), (1, 2),(2, 1) | D. | (1, 1), (3, 1), (2, 2) |  | A. | -6, 4, -8 | |  |  | B | -6, 4, -8 |
|  | ***y*** |  |  |  |  | 5, 0, 6  7, 5, -1 | | |  | -10, 0, 6  -14, 5, -1 | |

***x*** C.



**-2 P 1 T**

**S -1**

**-2**

-6, -4, 2

-10, -2, -12

-14, 10, 2

##### D -6, 4, -8

-10, 0, -12

-14, 40, 2

Triangle SPT is the solution of the linear inequalities

1. 2y – x – 2  0, y + 2x + 2  0, x  0
2. 2y – x – 2  0, y + 2x + 2  0,  0
3. 2y – x – 2  0, y + 2x + 2  0,  0, x  -1
4. -2y < x  2  0, y + 2x + 2  0,  0
5. . The sixth term of an arithmetic progression is half of its twelfth term. The first term is equal to
   1. half of the common difference
   2. double of the common difference
   3. the common difference D. zero
6. A man saves #100.00 in his first year of work and each year saves #20.00 more than in the preceding year. In how many years will he save #580.00
   1. 20 years B. 29 years

C. 58 years D. 100 years

1. An operation \* is defined on the set of real numbers by a\*b = a + b + 1. if the identity elements is -1, find the inverse of the element 2 under.

##### -4 B. 2

C. 0 D. 4

17

|  |  |  |  |
| --- | --- | --- | --- |
| **x** | ***k*** | ***l*** | ***m*** |
| ***k*** | ***l*** | ***m*** | ***k*** |
| ***l*** | ***m*** | ***k*** | ***l*** |
| ***m*** | ***k*** | ***l*** | ***m*** |



The identity element with respect to the multiplication shown in the table above is

A. k B. l

C. m D. o

18. Given that matrix k = (2, 1) the matrix

(3, 4)

1. Find the number of sides of a regular polygon whose interior angle is twice the exteriorangle

##### 2 B. 3

##### C. 6 D. 8

**S**



**T**

**25O**

**75O**

**P Q R**

In the figure above, PQR is a straight line segment, PQ = QT. Triangle PQT is an isosceles triangle, < SRQ is 750 and < QPT = 250. calculate the value of < RST.

##### A. 250 B. 450

##### C. 500 D. 550

1. A cylindrical tank has a capacity of 3080m3. what is the depth of the tank if the diameter of its base is 14m?
   1. 20m B. 22m

C. 23m D. 25m

1. A sector of a circle of radius 7.2 cm which subtends an angle 3000 at the centre is used to form a cone. What is the radius of the base of the cone?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 6cm | B. | 7cm |
| C. | 8cm | D. | 9cm |

1. The chord ST of a circle is equal to the radius, r of the circle. Find the length of arc ST.
   1. r/2 B. r/3

C. r/6 D. r/12

1. A point P moves such that it is equidistant from the points Q and R. find QR when PR = 8cm and < PRQ

= 300

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| k2 + k + 1, where I is the 2 x 2 identity matrix, is | | | | | | A. | 4cm | B. | 43cm |
| A. (9, 8 ) | | B. | | | (10, 7) | C. | 8cm | D. | 83cm |
| (22, 23) | |  | | | (21, 24) |  |  |  |  |
|  |  |  |  |  |  | 27. Find the locus of a point which moves such that its | | | |
|  | C. (7, 2) |  |  | D. | (6, 3) | distance from the line y = 4 is a constant, k. | | | |
|  | (12, 21) |  |  |  | (13, 20) | A. y = 4 + k B. y = k – 4 | | | |
|  |  |  |  |  |  | C. y = k ± 4 D. y = 4 ± k | | | |
| 19. | Evaluate | -1 | -1 | -1 |  |  | | | |
|  |  | 3 | 1 | 1 |  | 28. A straight line makes an angle of 300 with the positive | | | |
|  |  | 1 | 2 | 1 |  | x-axis and cuts the y-axis at y = 5. find the equation | | | |
|  |  |  |  |  |  | of the straight line. | | | |

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3y = x + 5y3 | B. | 3y = -x + 53 |
| C. | y = x + 5 | D. | y = 1/10x + 5 |

1. P(-6, 1) and Q(6, 6) are the two ends of the diameter of a given circle. Calculate the radius

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3.5 units | B. | 6.5 units |
| C. | 7.0 units | D. | 13.0 units |

1. Find the value of p if the line joining (p, 4) and (6,- 2) is perpendicular to the line joining (2, p) and (-1, 3)

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 0 | B. | 3 |
| C. | 4 | D. | 6 |

1. The bearing of P and Q from a common point N are 0200 and 3000 respectively. If P and Q are also equidistant from N, find the bearing of P from Q.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3200 | B. | 2800 |
| C. | 0700 | D. | 0400 |



***t***

**0**

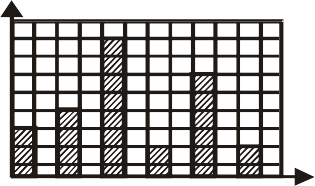
***t***

**3*t***

40.

41

**No . of cars 8**

**7**

**6**

**5**

**4**

**3**

**2**

**1**

**Yellow**

**White**

**Red**

**Green**

**Blue**

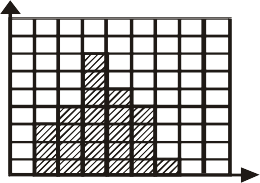
**Black**

**Color of cars**

The bar chart above shows different colours of cars passing a particular point of a certain street in two minutes. What fraction of the total number of cars is yellow?

##### A. 4/15 B. 1/5

C. 3/25 D. 2/25

**No . of taxis 8**

**7**

**6**

**5**

**4**

**3**

**2**

**1**

**0**

**0.5**

**2.5**

**4.5**

**6.5**

**8.5**

**10.5**

**12.5**

**No . of passengers**

The histogram above shows the distribution of passengers in taxis of a certain motor park. How many taxis have more than 4passenger?

A. 14 B. 15

C. 16 D. 17

#### Using the table below to answer questions 42 and 43

1. If y = x sin x, find dy/dx when x = /2

**Score**

**Frequency**

**4 7**

**3 5**

**8 11 13 8**

**2 7 2 1**

|  |  |  |  |
| --- | --- | --- | --- |
| FAi.nd th | e v3a0l0ue of q in the | diBa.gram | ab6o0v0e. |
| C. | 1000 | D. | 1200 |
| Differentiate (2x + 5)2(x - 4) with respect to x | | | |
| A. | (2x + 5)(6x - 11) | B. | (2x+ 5)(2x – 13) |
| C. | 4(2x + 5)(x - 4) | D. | 4(2x + 5)(4x - 3) |

* 1. /2 B. 1 42. Find the square of the mode

##### C. –1 D. /-2

1. If the gradient of the curve

y = 2kx2 + x + 1 at x = 1 find k

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1 | B. | 2 |
| C. | 3 | D. | 4 |

1. Find the rate of change of the volume V of a sphere with respect to its radius r when r = 1

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 4 | B. | 8 |
| C. | 12 | D. | 24 |

1. Find the dimensions of the rectangle of greatestarea which has a fixed perimeter p.
   1. Squareofsidesp/4 B. Squareofsidesp/2

C. Squareof sidesp D. Square of sides 2p

##### A. 25 B. 49

##### C. 64 D. 121

1. The mean score is

##### 11.0 B. 9.5

##### C. 8.7 D. 7.0

1. Find the range of 1/6, 1/3, 3/2, 2/3, 8/9 and 4/3

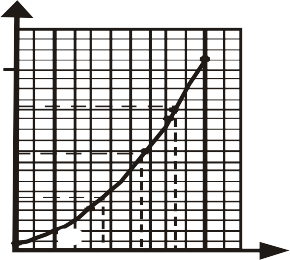
##### 4/3 B. 7/6

C. 5/6 D. ¾

1. Find the variance of 2, 6, 8, 6, 2 and 6

##### 5 B. 6

C. 5 D. 6



1. Evaluate  2(2x - 3)2/3 dx

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 2x – 3 + k | B. | 2(2x - 3) + k |
| C. | 6/5(2x - 3)5/3 + k | D. | 3/5(2x - 3)5/3 + k |

1. Find the area bounded by the curves y = 4 – x2
   1. 101/ sq. units B. 102/ sq. units
2. 201/3 sq. units D. 202/3sq. units

3 3

**Cumulative frequency 50**

**40**

**30**

**P 20**

**10**

**0**

**5.5**

**Masses (Kg)**

**10.5**

**15.5**

**20.5**

**25.5**

**30.5**

The graph above shows the cumulative frequency of the distribution of masses of fertilizer for 48 workers in one institution. Which of the following gives the interquartile range?

* 1. Q3 – Q1 B. Q3 – Q2

C. Q2 – Q1 D. ½ (Q3 – Q1)

1. Find the number of ways of selecting 8 subjects from 12 subjects for an examination.

##### 498 B. 496

49.

|  |  |  |  |
| --- | --- | --- | --- |
| **Colour Blue** | **Black Yellow** | **White** | **Brown** |
| **No . of beads 1** | **2 4** | **5** | **3** |

The distribution of colors of beads in a bowl is given above. What is the probability that a bead selected at random will be blue or white?

A. 1/15 B. 1/3

C. 2/5 D. 7/15

C. 495 D. 490

1. If 6P = 6, find the value of 6P

r r+1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 15 | B. | 30 | C. | ½ | D. | 2/3 |
| C. | 33 | D. | 35 |  |  |  |  |

1. Teams P and Q are involved in a game of football. What is the probability that the game ends in a draw?
   1. ¼ B. 1/3

# Mathematics 2002

4

1. A trader bought goats for #4 000 each. He sold them for #180 000 at a loss of 25%. How many goats did

8. Find the value of & if the line 2y - &x + 4 = 0 is perpendicular to the line y + 1/ x – 7 =

he buy? 0

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A. | 36 | B. | 45 | A. | -8 | B. | –4 |
|  | C. | 50 | D. | 60 | C. | 4 | D. | 8 |
| 2. Simplify (0.7 + 70)2 9. A bucket is 12cm in diameter at the top, 8cm in | | | | | | | | |
|  | A. | 217.7 | B. | 168.7 | diameter at the bottom and 4cm deep. Calculates its | | | |
|  | C.  Evaluate | 84.7 | D. | 70.7 | volume.  A. 144cm3 B. 304cm3/3  C. 72cm3 D. 128cm3/ | | | |
| 3. |  |  |  |

(0.21 x 0.072 x 0.0054)/ (0.006 x 1.68 x 0.063)

correct to four significant figures.

##### A. 0.1286 B. 0.1285

##### C. 0.01286 D. 0.01285

1. In a school, 220 students offer Biology or Mathematics or both. 125 offer Biology and 110 Mathematics. How many offer Biology but not Mathematics?

##### 125 B. 110

##### C. 95 D. 80

1. Simplify 52.4 – 5.7 – 3.45 – 1.75

##### 42.2 B. 42.1

##### C. 41.5 D. 41.4

1. Without using tables, evaluate (343)1/3 x (0.14)-1 x (25)1/2

##### 7 B. 8

##### C. 10 D. 12



**O *r***

In the diagram below are two concentric circles of radii r and R respectively with centre O. if r = 2/5 R, express the area of the shaded portion in terms of  and R.

##### 9/ R2 B. 5/ R2

10.

**X Z**

**O**

**Y**

In the diagram below, XZ is the diameter of the circle XYZW, with centre O and radius 15/2cm. If XY = 12cm, find the area of the triangle XYZ.

A. 75cm2 B. 54cm2

C. 45cm2 D. 27cm2

1. Find the coordinate of the midpoint of x and y intercepts of the line 2y = 4x - 8

##### (-1, -2) B. (1, 2)

C. (2, 0) D. (1, -2)

1. A chord of a circle subtends an angle of 1200 at the centre of a circle of diameter 4Ö3cm. Calculate the area of the major sector.
   1. 32cm2 B. 16cm2

C. 8cm2 D. 4cm2

1. If tan q = 4/3, calculate sin2  - cos2 .

##### 7/25 B. 9/25

C. 16/25 SD. 24/25

**P**



***x***

**Q**

**R**

**S**

**72O**

25 9

R

C. 21/ R2 D 21/ 2

25

23

**T**

In the diagram above, PST is a straight line, PQ = QS

= RS. If < RSRT = 720, find x.

##### A. 720 B. 360

C. 240 D. 180

1. The locus of a point P which is equidistant from two given points S and T is
   1. a perpendicular to ST
   2. a line parallel to ST
   3. the angle bisector of PS and ST
   4. the perpendicular bisector ST
2. The range of the data k + 2, k – 3, k + 4, k – 2, k, k – 5, k + 3, k – 1 andk + 6 is.

##### 6 B. 8

C. 10 D. 11



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |



The distribution above shows the number of days a group of 260 students were absent from school in a particular term. How many students were absent for at least four days in the term?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 16. A solid hemisphere has radius 7cm. Find the total | A. | 40 | B. | 120 |
| surface area. | C. | 160 | D. | 210 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A. | 462cm2 | B. | 400cm2 |  | | |
| C. | 308cm2 | D. | 66cm2 | 25. | **Music** | **History U80** |

**Q**

**30 *-x x* 40 *-x***

**20**

17.



**50O**

**R**

**128O**

**P**

The angle PGR below is

* 1. a scalene triangle
  2. an isosceles triangle
  3. an equilateral triangle
  4. an obtuse – angled triangle

1. The sum of the interior angles of a polygon is 20 right angles. How many sides does the polygon have?

##### 10 B. 12

C. 20 D. 40

1. Find the equation of the set of points which are equidistant from the parallel lines x = 1 and x = 7
   1. y = 4 B. y = 3

C. x = 3 D. x = 4



**3cm 23cm**

In the diagram below, a cylinder is surrounded by a hemispherical bowl. Calculate the volume of the

The venn diagram below shows the number of students offering Music and History in a class of 80 students. If a student is picked at random from the class, what is the probability that he offers Music only?

##### 0.13 B. 0.25

##### C. 0.38 D. 0.50

1. Find the mean of the data 7,-3,4,-2,5,-9,4,8,-6,12

##### 1 B. 2

##### C. 3 D. 4

1. The probability of a student passing any examination is 2/3. if the student takes three examination, what is the probability that he will not pass any of them?

##### 1/27 B. 8/27

C. 4/9 D. 2/3

1. How many three-digit numbers can be formed from 32564 without digit being repeated?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 10 | B. | 20 |
| C. | 60 | D. | 120 |

1. The acres for rice, principle, cassava, cocoa and palm oil, in a certain district are given respectively as 2,5,3, 11 and 9. what is the angle of the sector for cassava in a pie chart?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| solid. |  |  |  | A. | 360 | B. | 600 |
| A. | 216cm3 | B. | 198cm3 | C. | 1080 | D. | 1800 |
| C. | 180cm3 | D. | 162cm3 |  |  |  |  |

1. A hunter 1.6m tall, views a bird on top of a tree at an
2. Calculate the mean deviation of the set of numbers 7,3,14,9,7 and 8

angle of 450. If the distance between the hunter and the tree is 10.4m, find the height of the tree.

* 1. 21/

##### C. 21/

2

6

* 1. 21/

##### D. 11/

3

6

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| A. | 8.8m | B. | 9.0m |  | |
| C. | 10.4m | D. | 12.0m | 31. | Find the maximum value of y in theequation  y = 1 – 2x – 3x2 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 22. The mean of a set of six numbers is 60. if the mean of | A. | 5/3 | B. | 4/3 |
| the first five is 50, Find the sixth number in the set. | C. | 5/4 | D. | ¾ |

|  |  |  |
| --- | --- | --- |
| A. | 110 | B. 105 |
| C. | 100 | D. 95 32. If the 9th term of an A. P is five times the 5th term, find the relationship between a and d. |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | a + 2d = 0 | B. | a + 3d = 0 | C. | (-3,0) | D. | (9, 4) |
| C. | 3a + 5d = 0 | D. | 2a + d = 0 |  | (0 -3) |  | (12, 1) |

1. The time taken to do a piece of work is inversely proportional to the number of men employed. If it takes 45men to do a piece of work in 5 days, how long will take 25 men?
2. Find the range of values of x for which x + 2/4 – 2x – 3/3 <4
   1. x > -3 B. x < 4
3. x > -6 D. x < 8



n

* 1. 5 days B. 9 days

C. 12 days D. 15 days

1. If x varies directly as when n = 17/9

and x = 9 when n = 9, find x

1. The binary operation is defined on the set of integers p and q by p\*q = pq + p + q. find 2 (3\*4)

##### 27 B.

C. 4 D.



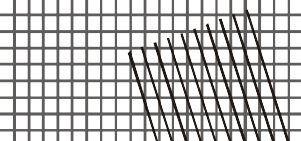
17

3

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | A. | 19 | | B. | 38 | 43. | The sum of infinity of the series | | | |
| C. | 59 | | D. | 67 |  | 1 + 1/3 + 1/9 + 1/27 + is  A. 3/2 B. 5/2 | | | |
| 35. | If –2  + 3x | is the solution of the – 7, find the value of | | equation c. | 2x + 1 – 3c = 2c |  | C. 10/3 D. 11/3 | | | |
|  | A. | 1 | | B. | 2 | 44. | Make r the subject of the formula | | | |
|  | C. | 3 | | D. | 4 |  | x/r + a = a/r | | | |
|  |  |  |  | |  |  | A. | a/(x – a) | B. | (a/x + a |
| 36. | If N = 3 5 -4 | |  | |  |  | C. | a2/(x – a) | D. | a2/(x + a) |
|  |  | 6 -3 -5 |  | |  |  |  |  |  |  |
|  |  | -2 2 1, | find /N/ | |  | 45. | If y = x2 | – 1/x, find dy/dx |  |  |
|  | A. | 91 | B. | | 65 |  | A.  C. | 2x + x2 2x – 1/x2 | B.  D. | 2x – x2 2x – 1/x2 |
|  | C. | 23 | D. | | 17 |  |  |  |  |  |

1. Use the graph below to find the values of p and q if 46. Evaluate sin3xdx

px + qy < 4 ***y***



|  |  |  |  |
| --- | --- | --- | --- |
| A. | -2/3 cos 3x + c | B. | –1/3 cos 3x + c |
| C. | 1/3 cos 3x + c | D. | 2/3 cos 3x + c |

***x***

**(0,2)**

**(-4,0)**

A. p = 1, q = 2 B. p = 2, q = 1

C. p = -1, q = 2 D. p = 2, q = -1

1. The inverse of the function f(x) = 3x + 4 is

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1/3(x + 4) | B. | 1/4(x + 3) |
| C. | 1/5(x - 5) | D. | 1/3(x - 4) |

1. Solve for x in the equation x3 – 5x2 - x + 5 = 0
2. A circle with a radius 5cm has its radius increasing at the rate of 0.2cms-1. what will be the corresponding increase in the area?
   1. 5p B. 4p

C. 2p D. p

1. If dy/dx = 2x – 3 and y = 3 when x = 0, find y in terms of x.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | x2 – 3x | B. | x2 – 3x + 3 |
| C. | 2x2 – 3x | D. | x2 – 3x – 3 |

1. Find the derivative of y = sin2(5x) with respect to x

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A. | 1, 1 or 5 | B. | –1, 1 or –5 | A. | 2 sin 5x cos 5x B. | 5 sin 5x cos 5x |
| C. | 1, 1 or –5 | D. | 1, -1 or 5 | C. | 10 sin 5x cos 5x D. | 15 sin 5x cos 5x |

1. If P = (2, 1)

(-3 0) and I is a 2 x 2 unit matrix, evaluate p2 – 2p + 41

1. The slope of the tangent to the curve y = 3x2 – 2x + 5 at the point (1, 6) is
   1. (2, 1)

(4, 1)

* 1. (1, 0)

(0, 1)

A. 1 B. 4

* 1. 5 D. 61.

# Mathematics 2003

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. | Simplify | 1 – (21/ | x 11/ | ) | + 3/ |  | A. | 133 | B. | 113 |
|  | A. | -231/ | 3 | 4 | 5 | **–27/** | C. | 63 | D. | 84 |

C. –119/ **D. –11/**

60 **15**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 2. A cinema hall contains a certain number of people. | A. | 132114 | B. | 103114 |
| If 221/ % are children, 471/ % are men and 84 are  2 2 | C. | 103214 | D. | 122314 |

1. Simplify 2134 x 234

women, find the number of men in the hall.

1. A woman buys 270 oranges for # 1800.00 and sells at 5 for #40.00. what is her profit?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | (1 3) | B | (1 -3) |
|  | (0 1) |  | (0 -1) |
| C. | (1 3) | D. | (-1 3) |
|  | (0 -1) |  | (0 -1) |

|  |  |  |  |
| --- | --- | --- | --- |
| A. | #630.00 | B. | #360.00 |
| C. | #1620.00 | D. | #2160.00 |

1. Simplify 98 - 50)

32

|  |  |  |  |
| --- | --- | --- | --- |
| A. | ½ | B. | ¼ |
| C. | 1 | D. | 3 |

1. The sum of four numbers is 12145. what is the average expressed in base five?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 411 | B. | 401 |
| C. | 141 | D. | 114 |

1. Evaluate log24 + log1/216 – log432

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -2.5 | B. | 5.5 |
| C. | –5.5 | D. | 2.5 |

1. Given:

U = {Even numbers between 0 and 30}

P = {Multiples of 6 between 0 and 30}

Q = {Multiples of 4 between 0 and 30}

Find (PUQ)c.

##### {0,2, 6, 22, 26} B. {2,4, 14, 18, 26}

C. {2,10, 14, 22, 26} D. {0,10, 14, 22, 26}

1. In a class of 40 students, 32 offer Mathematics, 24 offer Physics and 4 offer neither Mathematics nor Physics. How many offer both Mathematics and Physics?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 16 | B. | 4 |
| C. | 20 | D. | 8 |

1. Find the values of x and y respectively if 3x – 5y + 5

= 0 and 4x – 7y + 8 = 0

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -4, -5 | B. | –5, -4 |
| C. | 5, 4 | D. | 4, 5 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| If – | (x, 2) = (  (4x, 1) | 3, 3x)  (4, –5) | find the val | ue of x |
| A. | -2 |  | B. | –5 |
| C. | 2 |  | D. | 5 |

1. Find the range of values of x satisfying the inequalities 5 + x  8 and 13 + ³ 7.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -6  x  3 | B. | -6  x  -3 |
| C. | 3  x  6 | D. | –3  x  3 |

1. x varies directly as the product of U and V and inversely as their sum. If x = 3 when U = 3 and V = 1, what is the value of x if U = 3 and V = 3?
   1. 4 B. 9

C. 6 D. 3

#### y



**P**

**O**

**Q**

***x +* 1 = 0**

***x***

1. Find (1/0.06  1/0.042)-1, correct to two decimal places

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 4.42 | B. | 3.14 |
| C. | 1.53 | D. | 1.43 |
| If 92x – 1/27x + 1 = 1, find the value of x. | | | |
| A. | 2 | B. | 8 |
| C. | 5 | D. | 3 |

1. Factorize completely

4abx – 2axy – 12b2x +6bxy

* 1. 2x(3b- a)(2b- y) B. 2x(a– 3b)(b- 2y)

C. 2x(2b- a)(3b- y) D. 2x(a– 3b)(2b- y)

Triangle OPQ above is the solution of the inequalities.

* 1. x – 1  0, y + x  0, y, - x  0
  2. x + 1  0, y + x  0, y, - x  0
  3. y + x  0, y – x  0, x – 1  0
  4. x –1  0, y – x  0, y + x  0

Three consecutive terms of a geometric progression are given as n – 2, n and n + 3. find the common ratio.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 2/3 | B. | 3/2 |
| C. | ½ | D. | ¼ |

1. The sum of the first n terms of an arithmetic progression is 252. if the first term is –16 and the last term is 72, find the number of terms in the series.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 7 | B. | 9 |
| C. | 6 | D. | 8 |

1. The graphs of the function y = x2 + 4 and a straight line PQ are drawn to solve the equation x2 – 3x + 2 =

0. what is the equation of PQ?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A. | y = 3x + 2 | B. | y = 3x – 4 |  |
| C. | y = 3x + 4 | D. | y = 3x – 2 | **42O** |

1. The length a person can jump is inversely proportional to his weigth. If a 20kg person can jump

1.5 m, find the constant of proportionality.

##### A. 30 B. 60

C. 15 D. 20

**N**

**P**

**O**

**40O**

**M**

**Q**

1. A matrix P has an inverse P-1 = (1 -3)

(0, 1) Find P.

In the diagram above, O is the centre of the circle, POM is a diameter and  MNQ = 420. calculate

##### QMP.

1. An aeroplane flies due north from airports P to Q and then flies due east to R. if Q is equidistant from P and R, find the bearing of P and R.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 1380 | B. | 1320 | A. | 2700 | B. | 0900 |
| C. | 420 | D. | 480 | C. | 1350 | D. | 2250 |

1. The locus of a point P which moves on one side only of a straight line XY so that  XPY = 900 is.
   1. the perpendicular bisector of XY
   2. a circle C. a semicircle

D. an arc of a circle through X,Y

1. **P R**



1. Find the value of p, if the line of which passes through (-1, -p) and (-2, 2) is parallel to the line 2y + 8x – 17

= 0.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | –2/7 | B. | 7/6 |
| C. | –6/7 | D. | 6/7 |

1. Find the equation of the locus of a point P(x, y) which is equidistant form Q(0,0) and R(2, 1).

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 2x + y = 5 | B. | 2x + 2y = 5 |
| C. | 4x + 2y = 5 | D. | 4x – 2y = 5 |

1. An arc of a circle subtends an angle of 300 on the circumference of a circle of a radius 21cm. Find the

the value of  +  + y?

|  |  |  |  |
| --- | --- | --- | --- |
| **Q S** length of the arc | |  | |
| A. | 66cm | B. | 44cm |
| In the diagram above, PQ is parallel to RS. What is C. | 22cm | D. | 11cm |

##### 1800 B. 900

C. 2000 D. 3600

1. Whicch of the following is the graph of sin for

-    

2 

##### B.

**1**

**0**

**2**

**3**

**2 2**

**1**

**1**

**0**

**2 1**

**2**

**3**

**2**

1. A trapezium has two parallel sides of length 5cm and 9cm. If the area is 121cm2, find the distance between the parallel sides.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 7cm | B. | 3cm |
| C. | 4cm | D. | 6cm |



**45O**

**Z**

**X**

**7 cm**



D.

**1**

**0**

**2 1 2**

**3**

**2**

**1**

**0 3**

**2 1 2 2**

C.

### Y

XYZ is a circle centre O and radius 7cm. Find the area of the shaded region.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 14cm2 | B. | 38cm2 |
| C. | 77cm2 | D. | 84cm2 |

1. A triangle has vertices P(-1, 6), Q(-3, -4) and R(1, - 4). Find the midpoints of PQ and QR respectively.
   1. (-1, 0)and (-1, -1) B. (-2, 1) and (-1, -4)

C. (0,-1)and (-1, -4) D. (-2,1) and (0, 1)

1. Evaluate 3 (x2 – 2x)dx

2

In the diagram above, PQR is a straight line and PS is a tangent to the circle QRS with /PS/ = /SR/ and



**R**

**O**

**Q**

**40O**

**P**

**S**

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 4/3 | B. | 1/3 |
| C. | 2 | D. | 4 |
| If y = 3 sin (-4x), dy/ dx is | | | |
| A. | -12 cos (-4x) | B. | 12 sin (-4x) |
| C. | 12x cos (4x) | D. | –12x cos (-4x) |

SPR = 400. find PSQ. 37.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 200 | B. | 100 |
| C. | 400 | D. | 300 |

1. If /  2, find the maximum value of f() = 4/6 + 2 cos 

2

##### 1 B. ½

C. 4 D. 2/3

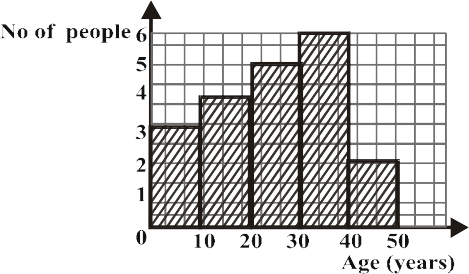
1. Determine the maximum value of y = 3x2 + 5x – 3 at

##### 6 B. 0

C. 2. D. 4

1. Find the slope of the curve y = 2x2 + 5x – 3 at (1, 4).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 7 | B. | 9 | A. | #48.00 | B. | #96.00 |
| C. | 4 | D. | 6 | C. | #42.00 | D. | #84.00 |

1. 45. The range of 4, 3, 11, 9, 6, 15, 19, 23, 27, 24, 21 and

16 is

##### 23 B. 24

##### C. 21 D. 16

46.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Number 1** | **2** | **3 4** | **5** | **6** |
| **Frequency 12** | **20** | ***x* 21** | ***x* -1** | **28** |

The histogram above shows the ages of the victims of a pollution. How many people were involved in the pollution?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 18 | B. | 21 | C. | 22 | D. | 20 |
| C. | 15 | D. | 20 |  |  |  |  |

The result of tossing a fair die 120 times is summarized above. Find the value of x.

##### 21 B. 19

47. If nP – 6 (nC ) = 0, find the value of n

3 4

e. 

48.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Value** Find th**0**e m | ea**1**n | of th**2**e d | istri**3**butio | n a**4**bov |
| **Frequen**A**cy**. **1** 4  C. 1 | **2** | **2** | **1**B.  D. | **9** 3  2 |

A. 6 B. 5

C. 8 D. 7

1. ½ B. 1/3

TCw. o dice¼are thrown. WhatDis. the pro2b/3ability that the sum of the numbers is divisible by 3.

1. The mean of the numbers 3, 6, 4, x and 7 is 5. find the standard deviation

##### 2 B. 3

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| C. | 3 | D. | 2 | A. | 24 | B. | 18 |
|  |  |  |  | C. | 3 | D. | 6 |

1. Find the number of committees of three that can be formed consisting of two men and one woman from four men and three women.
2. A bag contains 5 blsck ball and 3 red balls. Two balls are picked at random without replacement. What is the probability that a black and a red balls are picked?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A. | 5/14 | B. | 13/28 | A. | 0.50 | B. | 0.75 |
| C. | 3/14 | D. | 15/28 | C. | 0.17 | D. | 0.33 |

1. By how much is the mean of 30, 56, 31, 55, 43 and 44 less than the median.
2. On a pie chart, there are four sectors of which three angles are 450, 900 and 1350. if the smallest sector represents #28.00, how much is the largest sector?

# Mathematics 2004

C. (0,0)and(1,1) D. (2,2)only

A 2/25

1. 19/

##### 7/ D. 19/

35

12

1 4 2 4 3

60

**\_**

1 3 *x* 4

*y* 3 4 4

Find x and y respectively in the subtraction above c arried out in base 5

##### A. 2, 4 B. 3, 2

C. 4, 2 D. 4, 3

1. A farmer planted 5000 grains of maize and harvested 5000 cobs, each bearing 500 grains. What is the ratio of the number of grains sowed to the number harvested?

##### 1:500 B. 1:5000

C. 1:25000 D. 1:250000

1. Three teachers shared a packet of chalk. The first teacher got 2/5 of the chalk and the second teacher received 2/15 of the remainder. What fraction did the third teacher receive?
2. Find p, if 4516
   1. 6117

– p7 = 3056

* 1. 1427
     1. 11/ B. 12/

C. 13/ D. 8/

25 25

25 15

* 1. 1167 D. 627

1. 1/ x 2/ + 1/ 6. Given that 342x, find the value of x

10 3 4

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 2 | B. | 3 |
| C. | 4 | D. | 6 |

1/  3/ - ¼

2 5

1. Simplify 1/3 + 2 in the form a + b3

##### -2 - 3 B. –2+ 3

C. 2- 3 D. 2+ 3

1. If 6log 2 – 3log 3 = 3log 0.2, find x.

x x 5

3/8

4/3

B.

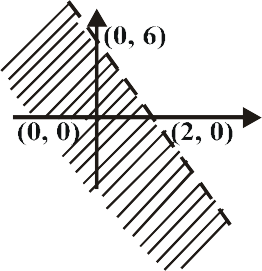
D.

¾ 8/3

**P Q**

**R**

***y***

16.

#### x

##### A.

C.

The shaded area in the diagram above is represented by

* 1. {(x, y) : y + 3x < 6}
  2. {(x, y) : y + 3x < - 6}
  3. {(x, y) : y - 3x < 6}
  4. {(x, y) : y - 3x < - 6}

The shaded region in the venn diagram above

A. Pc (QR)B. PQ

C. Pc U(QR) D. Pc (QUR)

1. What are the integral values of x which satisfy the inequality –1 < 3 – 2x  5?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | -2, 1, 0, -1 | B. | -1, 0, 1, 2 |
| C. | -1, 0, 1, | D. | 0, 1, 2 |

1. The nth terms of two sequences are Q – 3.2n-2 and

m

1. In a class of 40 students, each student offers at least

U = 3.22m –

n

. find the product of Q2 and U2

one of Physics and Chemistry. If the number of

students that offer Physics is three times the number that offer both subjects and the number that offers Chemistry is twice the number that offer Physics, find the number of students that offer Physics only.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 25 | B. | 15 |
| C. | 10 | D. | 5 |

1. Find the values of x where the curve

y = x3 + 2x2 – 5x – 6 crosses the x-axis.

* 1. -2, -1 and 3 B. -2, 1 and –3

C. 2, -1 and –3 D. 2, 1 and 3

1. Find the remainder when

3x3 + 5x2 – 11x + is divided by x + 3

##### 4 B. 1

C. –1 D. 4

1. Factorize completely ac – 2bc – a2 + 4b2
   1. (a – 2b)(c + a – 2b)
   2. (a – 2b)(c - a – 2b)
   3. (a – 2b)(c + a + 2b)
   4. (a – 2b)(c - a + 2b)
2. y is inversely proportional to x and y = 4 when x = 1/ 2 . find x when y = 10

3

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 3 | B. | 6 |
| C. | 12 | D. | 18 |

1. Given that the first and fourth terms of a G.P are 6 and 162 respectively, find the sum of the first three terms of the progression.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 8 | B. | 27 |
| C. | 48 | D. | 78 |

1. Find the sum to infinity of the series ½, 1/6, 1/ 18,……………

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1 | B. | ¾ |
| C. | 2/3 | D. | 1/3+ |

1. If the operation \* on the set of integers is defined by p\*q = “pq, find the value of 4\*(8\*32).

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 16 | B. | 8 |
| C. | 4 | D. | 3 |

1. The inverse of the matrix (2 1)

(1 1)

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1/10 | B. | 1/5 |
| C. | 2 | D. | 10 |

1. The length L of a simple pendulum varies directly as the square of its period T. if a pendulum with period 4 secs is 64cm long, find the length of a pendulum whose period is 9 sec.
   1. 36cm B. 96ccm

C. 144cm D. 324cm

3 4 5

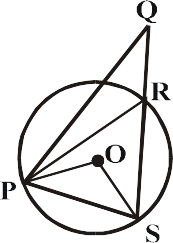
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| is |  |  |  |  |
| A. |  | (1 1) | B. | (1 -1) |
|  |  | (-1 2) |  | (1 2) |
| C. |  | (1 1) | D. | (1 -1) |
| If P |  | (1 2)  = 1 0 -1 |  | (-1 2) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | -1 0 | 1 | then /P/ is |  |
| A. | -8 |  | B. | 0 |
| C. | 4 |  | D. | 8 |

1. The sum of the interior angles of a pentagon is 6x + 6y. find y in terms of x

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A. | y = 60 – x B. | y = 90 – x | A. | (4, -4) | B. | (4, 4) |
| C. | y = 120 – x | D. y = 150 – x | C. | (2, 2) | D. | (1,1) |

1. PQRSTV is a regular polygon of side 7cm inscribed in a circle. Find the circumference of the circle PQRSTV.
   1. 22cm B. 42cm

C. 44cm D. 56cm

33.



**15 cm**

**X**

**45O**

**60O**

**20O**

**35O**

Find the value of x in the figure above.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 206 | B. | 156 |
| C. | 56 | D. | 36 |

34. The shadow of a pole 53 m high is 5m. find the angle of elevation of the sun.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | A. | 300 | B. | 450 |
| P, R and S lie on a circle centre O as shown above while Q lies outside the circle. Find ÐPSO. |  | C. | 600 | D. | 750 |
| A. 350 B. 400 | 35. | Find the | derivative of (2 | + 3x)(1 - | x) with respect to |

C.

550 x

1. 6x – 1 B. 1 – 6x

##### C. 6 D. 3

1. Find the derivative of the function y = 2x2(2x - 1) at the point x= -1

##### -6 B. 4

##### C. 16 D. 18

In the diagram above, PQ =4cm and TS = 6cm, if the



450

4 cm

D.

1. If y – 3 cos (x/ ), find dy/

when x = 3/

area of parallelogram PQTU is 32cm2, find the area

A. 2

3 dx 2

B. 1

of the trapezium PQRU

A. 24cm2 B. 48cm2

C. 60cm2 D. 72cm2

1. An arc of a circle of length 22cm subtends an angle of 3x0 at the centre of the circle. Find the value of x if the diameter of the circle is 14cm.

which is equidistant from PQ and QR

* 1. Thediagonal PR. B. Thediagonal QS

C. Side SR

##### C. –1 D. 3

1. What is the rate of change of the volume v of hemisphere with respect to its radius r when r = 2?

##### 2 B. 4

1. 8 D. 16
2. Theperpendicularbisector ofPQ.
3. 62/
4. 2/
5. -2/

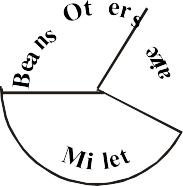
|  |  |  |  |
| --- | --- | --- | --- |
| A. | 300 | B. | 600 |
| C. | 1200 | D. | 1800 |
| Deter | mine the locus | of a point i | nside a s |

3 3

1. -62/

3 3

40.



**h**

**60O**

**150O**

**l**

**M**

1. The locus of a point which is 5cm from the line LM is a
   1. pair of lines on opposite sides of LM and parallel to it, each distances 5cm form LM
   2. line parallel to LM and 5cm from LM
   3. pair of parallel lines on one side of LM and parallel to LM
   4. line distance 10cm from LM and parallel to LM.
2. Find the value of 2 + 2 if a + b = and the distance between the points (1, ) ands (, 1) is 3 units.

##### 3 B. 5

C. 11 D. 14

1. Find the midpoint of the line joining P(-3, 5) and Q (5, -3).

The pie chart above shows the distribution of the crops harvested from a farmland in a year. If 3000 tonnes of millet is harvested, what amount of beans is harvested?

* 1. 9000 tonnes B. 6000 tonnes

C. 1500 tonnes D. 1200 tonnes

1. I. Rectangular bars of equal width

II. The height of each rectangular bar is proportional to the frequency of

the3 corresponding class interval.

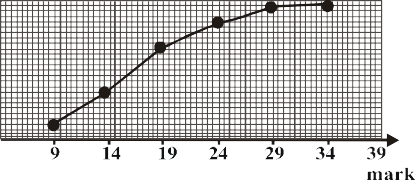
III. Rectangular bars have common

sides with no gaps in between.

A histogram is described by

A. I and II B. I and III

C. I,II and III D. II and III®



The graph above shows the cumulative frequency curve of the distribution of marks in a class test. What percentage of the students scored more than 20 marks?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 68% | B. | 28% |
| C. | 17% | D. | 8% |

1. In how many ways can 2 students be selected from a group of 5 students in a debating competition?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 10 ways. | B. | 15 ways. |
| C. | 20 ways | D. | 25 ways. |

1. A committee of six is to be formed by a state governor from nine state commissioners and three members of the state house of assembly. In how many ways can the members of the committee be chosen so as to include one member of the house of assembly?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 924 ways | B. | 840 ways |
| C. | 462 ways | D. | 378 ways |

1. Some white balls were put in a basket containing twelve red balls and sixteen black balls. If the probability of picking a white ball from the basket is 3/7, how many white balls wereintroduced?

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 32 | B. | 28 |
| C. | 21 | D. | 12 |

1. The mean age of a group of students is 15 years. When

the age of a teacher, 45 years old, is added to the ages of the students, the mean of their ages becomes 18 years. Find the number of students in the group.

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 7 | B. | 9 |
| C. | 15 | D. | 42 |

1. The weights of 10 pupils in a class are 15kg, 16kg, 17kg, 18kg, 16kg, 17kg, 17kg, 17kg, 18kg and 16kg.
2. An unbiased die is rolled 100 times and the outcome is tabulated as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
|  |  |  |  |  |

What is the probability of obtaining 5?

What is the range of this distribution?

##### 1 B. 2

CA. 1/

* 1. 1/

##### 3 D. 4

6 5

1. Find the mean deviation of 1, 2, 3 and 4

|  |  |  |  |
| --- | --- | --- | --- |
| A. | 1.0 | B. | 1.5 |
| C. | 2.0 | D. | 2.5 |

##### ¼ D. ½

1. A container has 30 gold medals, 22 silver medals and 18 bronze medals. If one medal is selected at random from the container, what is the probability that it is not a gold medal?

##### 4/ B. 3/

7 7

##### C. 11/ D. 9/

35 35