MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

DEPARTMENTAL MODEL PAPER

Part I

1. If $n(A \times B) = 6$ and A={1,3} then n (B) is

.........,

A. 1

B. 2

C. 3

D. 6

Answer: B

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2. Given

$F_1 = 1, F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$

then F_5 is

A. 3

B. 5

C. 8

D. 11

Answer:

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3. In an A.P., the first terms is 1 and the the common difference is 4. How many terms of

the A.P. must be taken for their sum to be

equal to 120?

A. 6

B. 7

C. 8

D. 9

Answer:

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4. $f = \{(2, 1), (3, b), (4, b), (5, c)\}$ is a____.

A. identiy function

B. one-one function

C. many-one function

D. constant function

Answer:

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5. The number of points of intersection of the quadratic polynomial $x^2 + 4x + 4$ with the X axis.

A. 0

B. 1

C. 0 or 1

D. 2

Answer:

6. The no-diagonal elements is any unit matrix are ___.

   A. 0

   B. 1

   C. m

   D. n

Answer:

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7. If A is a 2×3 matrix and B is 3×4 matrix, how many columns does AB have

A. 3

B. 4

C. 2

D. 5

Answer:

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8. In Fig. 10.74, CP and CQ are tangents to a circle with centre O . ARB is another tangent touching the circle at R . If $CP = 11cm$ and $BC = 7cm$, then find the length of BR .

(FIGURE)

    A. 6 cm

    B. 5 cm

    C. 8 cm

    D. 4 cm

Answer:

9. The slope of the line joining $(12, 3)$, $(4, a)$ is $\dfrac{1}{8}$. The value of 'a' is

A. 1

B. 4

C. -5

D. 2

Answer:

10. If $x = a \tan \theta$ and $y = b \sec \theta$ then

A. $\dfrac{y^2}{b^2} - \dfrac{x^2}{a^2} = 1$

B. $\dfrac{x^2}{a^2} - \dfrac{y^2}{b^2} = 1$

C. $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$

D. $\left(\dfrac{x^2}{a^2}\right) - \left(\dfrac{y^2}{b^2}\right) = 0$

Answer:

11. A letter is chosen at random from the letter of the word "PROBABILITY". Find the probability that it is not a vowel.

A. $\dfrac{1}{5}$

B. $\dfrac{2}{3}$

C. $\dfrac{1}{3}$

D. $\dfrac{3}{5}$

Answer:

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12. The height of a right circular cone whose radius is 5 cm and slant height is 13 cm will be ....

    A. 12 cm

    B. 10 cm

    C. 13 cm

    D. 5 cm

Answer: A

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13. If the mean and coefficient of variation of a data are 4 and 87.5 % then the standard deviation is

    A. 3.5

    B. 3

    C. 4.5

    D. 2.5

Answer:

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14. Sum of first 20 natural numbers is 410.

A. 32.25

B. 44.25

C. 33.25

D. 30

Answer:

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Part Ii

1. Define a function as a set of ordered paris.

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2. Compute x scuh that $10^4 = x \pmod{19}$.

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3. Simplify $\dfrac{4x^2 y}{2z^2} \times \dfrac{6xz^3}{20y^4}$

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4. Peri needs 4 hours to complete a work. His friend Yuvan needs 6 hours to complete the same work. How long will take to complete if they work together?

5. Find the values of x, y, and z from the following equations

$$\begin{bmatrix} 12 & 3 \\ x & \frac{3}{2} \end{bmatrix} = \begin{bmatrix} y & z \\ 3 & 5 \end{bmatrix}$$

6. What length of ladder is needed to reach a height of 7 ft along the wall when the base of the ladder is 4 ft from the wall ?

7. Prove that : $\sqrt{\dfrac{1 + \cos\theta}{1 - \cos\theta}} = \cos ec\theta + \cot\theta.$

8. The radius of a sphere increases by 25% . Find the percentage increase in its surface area.

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9. The standard deviation and mean of a data are 6.5 and 12.5 respectively. Find the coefficient of variation.

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10. If $f(x) = 3 + x$, $g(x) = x - 4$, then check whether fog=gof.

11. An organization plans to plant saplings is 25 streets in a town in such a way that one sapling for the first street, three for the seconds, nine for the third and so on. How many sapling are needed to complete the work?

12. Find the 19th term of an A.P -11, -15,-19,......

13. The vertices of a triangle are A (-1.3), B (1,-1) and C (5, 1). Find the length of the median through the vertex C.

Part Iii

1. Let f be function $f: N \rightarrow N$ be defined by

$f(x) = 3x + 2, \xi n N.$

Find the images of 1, 2, 3

2. Let: $f: A \rightarrow B$ be a function defined by

$f(x) = \dfrac{x}{2} - 1.$ Where `A={2, 4, 6, 10, 12}, B={0, 1, 2, 4, 5, 9}. Represents f by

set of ordered pairs,

3. The ratio of 6th and 8th term of an A.P. is 7.9.

Find the ratio of 9th to 13th term.

4. If the sum of $n, 2n, 3n$ terms of an AP are

S_1, S_2, S_3 respectively   .   Prove   that

$S_3 = 3(S_2 - S_1)$

5. Find the values of m and n if the following expression are perfect squares.

$$\frac{1}{x^4} - \frac{6}{x^3} + \frac{13}{x^2} + \frac{m}{x} + n$$

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6. If α, β are the roots of the equation $2x^2 - x - 1 = 0$ then form the equation whose roots are $\alpha^2 \beta$?

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7. P and Q are the mid-points of the sides CA and CB respectively of a $\triangle ABC$, right angled at C. Prove that $4\left(AQ^2 + BP^2\right) = 5AB^2$.

8. Find the equation of a stright line passing through (1,-4) and has intercepts which are in the ratio 2:5

9. From the top of the tower 60 m high the angles of depression of the top and bottom of a vertical lamp post are observed to be $38°$ and $60°$ respectively. Find the height of the lamp post. $\left(\tan 38° = 0.7813, \sqrt{3} = 1.732\right)$

10. Find the coefficient of variation of 24,26,33,37,29,31.

11. Two dice, one blue and one grey, are thrown at the same time. Write down all the possible outcomes. What is the probability that the sum of the two numbers appearing on the top of the dice is

8

12. Find two consecutive positive integers, sum of whose squares is 365.

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13. A cylindrical bucket, 32 cm high and with radius of base 18 cm, is filled with sand. This bucket is emptied out on the ground and a conical heap of sand is formed. If the height of the conical heap is 24 cm, find the radius and slant height of the heap.

Part Iv

1. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length TP.

2. Draw a triangle ABC of base BC=8 cm, $\angle A = 60°$ and the bisector of $\angle A$ meets BC

at D such that BD=6 cm.

3. Draw the graph $y = x^2 + 3x - 4$ and hence use it to solve $x^2 + 3x - 4 = 0$.