MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

SAMPLE PAPER -5

Part I

1. If $\{(a, 8), (6, b)\}$ represents an identity functions then the values of a and b are

respectively

A. (8,6)

B. (8,8)

C. (6,8)

D. (6,6)

Answer:

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2. If the H.C.F. of 65 and 117 is expressible in the form of $65m - 117$, then the value of m is

A. 4

B. 2

C. 1

D. 3

Answer:

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3. The next term of the sequences $\dfrac{3}{16}, \dfrac{1}{8}, \dfrac{1}{12}, \dfrac{1}{18}, \ldots$

A. $\dfrac{1}{24}$

B. $\dfrac{1}{27}$

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

D. $\dfrac{1}{81}$

Answer:

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4. Which of the following should be added to make $x^4 + 64$ a perfect square.

A. $4x^2$

B. $16x^2$

C. $8x^2$

D. $-8x^2$

Answer:

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5. Find the matrix X if

$$2X + \begin{bmatrix} 1 & 3 \\ 5 & 7 \end{bmatrix} = \begin{bmatrix} 5 & 7 \\ 9 & 5 \end{bmatrix}$$

A. $\begin{bmatrix} -2 & -2 \\ 2 & -1 \end{bmatrix}$

B. $\begin{bmatrix} 2 & 2 \\ 2 & -1 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 2 \\ 2 & 2 \end{bmatrix}$

D. $\begin{bmatrix} 2 & 1 \\ 2 & 2 \end{bmatrix}$

Answer:

6. Two poles of heights 6 m and 11 stand vertically on a plane ground. If the distance between their feet is 12 m, what is the distance between their tops ?

    A. 13m

    B. 14m

    C. 15m

    D. 12.8 m

Answer:

7. If $(5, 7)$, $(3, p)$ and $(6, 6)$ are collinear, then the value of p is

A. 3

B. 6

C. 9

D. 12

Answer:

8. The value of $\sin^2 \theta + \dfrac{1}{1 + \tan^2 \theta}$ is equal to

A. $\tan^2 \theta$

B. 1

C. $\cot^2 \theta$

D. 0

Answer:

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9. If the radius of the base of a cone is tripled and the height is doubled then the volume is

A. made 6 times

B. made 18 times

C. made 12 times

D. unchanged

Answer:

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10. A page is selected at random from a book. The probability that the digit at units place of the page number chosen is less than 7 is

A. $\dfrac{3}{10}$

B. $\dfrac{7}{10}$

C. $\dfrac{3}{9}$

D. $\dfrac{7}{9}$

Answer:

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11. If $f = \{(6, 3)(8, 9)(5, 3)(-1, 6)\}$ then the pre-images of 3 are ....

A. 6 and -1

B. 6 and 8

C. 8 and -1

D. 6 and 5

Answer:

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12. If α and β are the zeros of the polynomials $P(x) = 4x^2 + 3x + 7$ thent $\dfrac{1}{\alpha} + \dfrac{1}{\beta}$ is equal to ....

A. $\dfrac{7}{3}$

B. $\dfrac{-7}{3}$

C. $\dfrac{3}{7}$

D. $\dfrac{-3}{7}$

Answer:

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13. The probability that a leap year will have 53 Fridays or 53 Saturdays is ....

A. $\dfrac{2}{7}$

B. $\dfrac{1}{7}$

C. $\dfrac{4}{7}$

D. $\dfrac{3}{7}$

Answer:

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1. A relation 'f' is defined by $f(x) = x^2 - 2$ where $\xi n\{-2, -1, 0, 3\}$

List the elements of f.

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2. If $f(x) = x^2 - 1$. Find fof

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3. What is the smallest number that when divided by three numbers such as 35, 56 and 51 leaves remainder 7 in each case?

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4. In a G.P. 729, 243, 81, ... find t_7

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5. Find the excluded values, if any of the following expressions

$$\frac{t}{t^2 - 5t + 6}$$

6. Find the square root of the following

$$9x^2 - 24xy + 30xz - 40yz + 25z^2 + 16y^2$$

7. Construct a 3×3 matrix whose elements are given by

$$a_{ij} = \frac{(i + j)^3}{3}$$

8. If $\triangle ABC \sim \triangle DEF$ such that area of $\triangle ABC$ is $9cm^2$ and the area of $\triangle DEF$ is $16cm^2$ and BC=2.1 cm. Find the length of EF.

9. If the area of the triangle formed by the vertices (p,p),(5,6),(5,-2) is 32 sq. units. Find the

value of p.

10. Find the angle of elevation of the top of a tower from a point on the ground, which is 30 m away the foot of a tower of height $10\sqrt{3}$m.

11. Find the diameter of a sphere whose surface area is $154m^2$.

12. Find the standard deviation and the variance of first 23 natural numbers.

Part Iii

1. A function $f : [-5, 9] \to R$ is defined as follows:

$$f(x) = \{(6x + 1 \text{ if } -5 \le x < 2), \quad (5\text{x}^\wedge(2)\text{-1"}$$

if "2lexlt6), (3x-4" if " 6lexle9):$\}F \in df$(-3)+f(2)`

2. If $S_1, S_2, S_3, \ldots, S_m$ are the sums of n

terms of m A.P.'s whose first terms are 1, 2, 4, ...,

m and whose common differences are 1, 3, 5, ...,

(2m-1) repectively, then show that

$$S_1 + S_2 + S_3 + \ldots + S_n = \frac{1}{2}mn(mn + 1)$$

3. Find the sum to n terms of the series

$0.4 + 0.44 + 0.444 + \ldots$to n terms.

4. Vani, her father and her grand father have an average age of 53. One-half of her grand father's age plus one-third of her father's age plus one fourth of Vani's age is 65. Four years ago if Vani's grandfather was four times as old as Vani then how old are they all now?

5. Find the values of a and b if the following polynomials are perfect squares

$$ax^4 + bx^3 + 361ax^2 + 220x + 100$$

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6. State and prove Pythagoras theorem.

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7. Find the equation of the median and altitude of $\triangle ABC$ through A where the vertices are $A(6, 2), B(-5, -1)$ and $C(1, 9)$.

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8. Two ships are sailing in the sea on either side of the lighthouse. The angles of depression of two ships as observed from the top of the lighthouse are $60°$ and $45°$

respectively. If the distance between the ships is $200\left(\dfrac{\sqrt{3}+1}{\sqrt{3}}\right)$ metres, find the height of the lighthouse.

9. Find the number of coins, 1.5 cm in diameter and 2 mm thick, to be melted to form a right circular cylinder of height 10 cm and diameter 4.5 cm.

10. A box contains cards numbered 3,5,7,9,..35,37. A card is drawn at random from the box. Find the probability that the drawn card have either multiples of 7 or a prime number.

11. Find X and Y if $X - Y = \begin{bmatrix} 2 & 1 \\ 4 & 3 \\ 0 & 6 \end{bmatrix}$ and $X + Y = \begin{bmatrix} 12 & 13 \\ 6 & 5 \\ 4 & 8 \end{bmatrix}$

12. A lead pencil is in the shape of a right circular cylinder. The pencil is 28 cm long and its radius is 3 mm. If the led is of radius one mm (1 m) then find the value of the wood used in the pencil.

Part Iv

1. Draw a circle of radius 4.5 cm. Take a point on the circle. Draw the tangent at that point using the alternate segment theorem.

2. Construct a $\triangle PQR$ in which QR= 5 cm, $P = 40°$ and the median PG from P to QR is 4.4 cm. Find the length of the altitude from P to QR.

3. Draw the graph of $y = x^2 - 4x + 3$ and use it to solve $x^2 - 6x + 9 = 0$

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4. Graph the following quadratic equations and state their nature of solutions.

$$x^2 - 4x + 4 = 0$$

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