MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

SAMPLE PAPER - 10 (UNSOLVED)

Part I

1. Let $A = \{1, 2, 3, 4\}$ and $B = \{4, 8, 9, 10\}$. A function $f: A \to B$ given by $f = \{(1, 4), (2, 8), (3, 9), (4, 10)\}$ is a

A. Many - one function

B. Identify function

C. One-to-one function

D. Into function

Answer:

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2. If $g = \{(1, 1), (2, 3), (3, 5), (4, 7)\}$ is a function given by $g(x) = \alpha x + \beta$ then the values of α and β are

A. $(-1, 2)$

B. $(2, -1)$

C. $(-1, -2)$

D. $(1, 2)$

Answer:

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3. The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is

A. 2025

B. 5220

C. 5025

D. 2520

Answer:

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4. If the sequence $t_1, t_2, t_3, \ldots$ are in A.P. then the sequence $t_6, t_{12}, t_{18}, \ldots$ is

A. a Geometric progression

B. an Arithmetic progression

C. neither an Arithmetic progression nor a Geometric progression

D. a constant sequence

Answer:

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5. $\frac{x}{x^2-25}-\frac{8}{x^2+6x+5}$ gives

A. $\frac{x^2-7x+40}{(x-5)(x+5)}$

B. $\frac{x^2+7x+40}{(x-5)(x+5)(x+1)}$

C. $\frac{x^2-7x+40}{(x^2-25)(x+1)}$

D. $\frac{x^2+10}{(x^2-25)(x+1)}$

Answer:

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6. The values of a and b if $4x^4-24x^3+76x^2+ax+b$ is a perfect square are

A. 100 , 120

B. 10 , 12

C. $-120, 100$

D. $12, 10$

Answer:

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7. If ΔABC is an isosceles triangle with $\angle C = 90^\circ$ and AC=5 cm, then AB is

A. 2.5 cm

B. 5 cm

C. 10 cm

D. $5\sqrt{2}$ cm

Answer:

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8. The area of triangle formed by the points $(-5, 0), (0, -5)$ and $(5, 0)$ is

A. 0 sq. units

B. 25 sq. units

C. 5 sq. units

D. none of these

Answer:

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

A. $\tan^2\theta$

B. 1

C. $\cot^2\theta$

D. 0

Answer:

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10. If the radius of the base of a right circular cylinder is halved keeping the same height, then the ratio of the volume of the cylinder thus obtained to the volume of original cylinder is

A. $1:2$

B. $1:4$

C. $1:6$

D. $1:8$

Answer:

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11. 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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12. If α and β are the roots of the equation $x^2 + 2x + 8 = 0$ then the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$ is ..... .

A. $\frac{1}{2}$

B. 6

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

D. $\frac{-2}{3}$

Answer:

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13. If the points (k , 2k) , (3 k , 3k) and (3 , 1) are collinear . Then k is

A. $\frac{1}{3}$

B. $\frac{-1}{3}$

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

D. $\frac{-2}{3}$

Answer:

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14. If the variance of 14 , 18 , 22 , 26 , 30 is 32 then the variance is 28 , 36 , 44 , 52 , 60 is ..... .

A. 64

B. 128

C. $32\sqrt{2}$

D. 32

Answer:

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Part Ii

1. Represent each of the given relation by (a) an arrow diagram, (b) a graph and (C) a set in roster form, wherever possible.

$\{(x, y) \mid y = x + 3, x, y$ are natural number $< 10\}$

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2. If $f: R \to R$ and $g: R \to R$ are defined by $f(x) = x^5$ and $g(x) = x^4$ then check if f, g are one-one and fog is one-one?

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3. Find the first five terms of the following sequence .

$a_1 = 1, a_2 = 1, a_n = \frac{a_{n-1}}{a_{n-2} + 3}, n \geq 3, n \in N$

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4. If $1^3 + 2^3 + 3^3 + \ldots + k^3 = 44100$ then find $1 + 2 + 3 + \ldots + k$.

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5. Find the LCM of each pair of the following polynomials

$a^2 + 4a - 12, a^2 - 5a + 6$ whose GCD is a-2

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6. Find the value of 'k' for which the roots of the following equations are real and equal

$kx^2 + (6k + 2)x + 16 = 0$

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7. Find the value of a , b , c , d , x , y from the following matrix equation .

$$\begin{pmatrix} d & 8 \\ 3b & a \end{pmatrix} + \begin{pmatrix} 3 & a \\ -2 & -4 \end{pmatrix} = \begin{pmatrix} 2 & 2a \\ b & 4c \end{pmatrix} + \begin{pmatrix} 0 & 1 \\ -5 & 0 \end{pmatrix}$$

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8. To get from point A to point B you must avoid walking through a pond. You must walk 34 m south and 41 m east. To the nearrest meter, how many meters would be saved if it were possible to make a way through the pond ?

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9. If the points $A(-3, 9), B(a, b)$ and $C(4, -5)$ are collinear and if $a + b = 1$, find the a and b.

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10. Prove that $\frac{\sin A}{1 + \cos A} + \frac{\sin A}{1 - \cos A} = 2 \cos ecA.$

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11. The probability that atleast one of A and B occur is 0.6. If A and B occur simultaneously with probability 0.2, then find $P(\overline{A}) + P(\overline{B})$.

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12. If n = 10 , $\bar{x} = 12$ and $\sum x^2 = 1530$, then calculate the coefficient of variation.

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13. Find the volume of the largest right circular cone that can be cut out of a cube whose edge is 14 cm .

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14. Find the sum of the firt 40 terms of the series $1^2 - 2^2 + 3^2 - 4^2$+.....

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Part Iii

1. Find x if gff(x) = fgg (x) , given f (x) = 3 x + 1 and g(x) =x+ 3 .

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2. In a G.P. the product of three consecutive term is 27 and the sum of the product of two terms taken at a time is $\frac{57}{2}$. Find the three terms.

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3. The 13^{th} term of an A.P is 3 and the sum of first 13 terms is 234 . Find the common difference and the sum of first 21 terms .

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4. If $S_n = (x+y) + \left(x^2 + xy + y^2\right) + \left(x^3 + x^2y + y^2x + y^3\right) + \ldots n$ terms then prove that $(x-y)S_n = \left[\frac{x^2(x^n-1)}{x-1} - \frac{y^2y^n-1}{y-1}\right].$

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5. Two woman together took 100 eggs to a market, one had more than the other. Both sold tham for the same sum of the money. The first then said to the second, "If 1 had your eggs, I would have earned ₹15", to which the second replied: "If 1 had your eggs, I would have earned ₹$6\frac{2}{3}$?. How many eggs did each had in the beginning?

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6. If the roots of $(a-b)x^2+(b-c)x+(c-a)=0$ are real and equal, then prove that b, a, c are in arithmetic progression.

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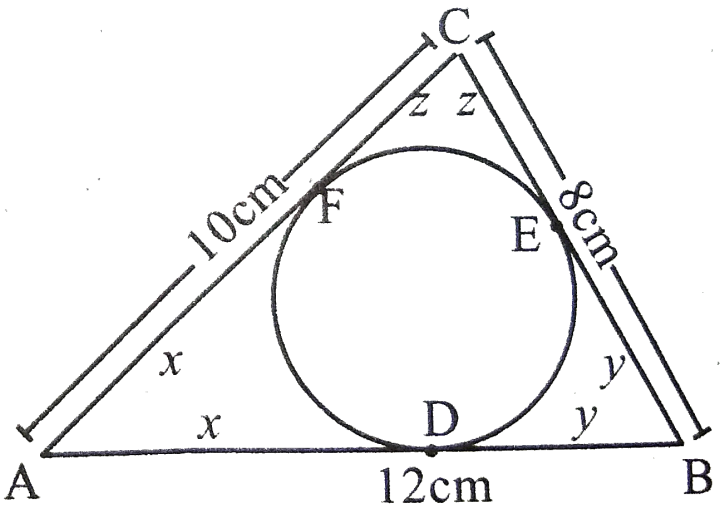
7. A circle is inscribed in ΔABC having sides 8 cm, 10 cm and 12 cm as shown in figure, Find AD, BE and CF.



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8. If $\sin\theta\left(1+\sin^2\theta\right)=\cos^2\theta$, then prove that $\cos^6\theta-4\cos^2\theta+8\cos^2\theta=4$

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9. A toy is in the shape of a cylinder surmounted by a hemisphere . The height of the toy is 25 cm . Find the total surface area of the toy is its common diameter is 12 cm .

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

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11. The probability that A , B , C can solve a problem are $\frac{4}{5}, \frac{2}{3}$ and $\frac{3}{7}$ respectively . The probability of the problem being solved by A and B is $\frac{8}{15}$, B and C is $\frac{2}{7}$, A and C is $\frac{12}{35}$. The probability of the problem being solved by all the three is $\frac{8}{35}$. find the probability that the problem can be solved by atleast one of them .

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12. Verify that $(AB)^T = B^T A^T$ if $A = \begin{pmatrix} 2 & 3 & -1 \\ 4 & 1 & 5 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 2 \\ 3 & -3 \\ 2 & 6 \end{pmatrix}$

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13. A function $f(-3,7) \to R$ is defined as follows

$$f(x) = \begin{cases} 4x^2+1 & -3 \le x < 2 \\ 3x-2 & 2 \le x \le 4 \\ 2x+3 & 4 < x < 7 \end{cases}$$

Find (i) 5 f(1) - 3 f(-2) (ii) 3f (-3) + 4 f (iii) $\frac{7f(3)-f(-1)}{2f(6)-f(1)}$

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Part Iv

1. Construct a ΔPQR such that QR= 6.5 cm, $\angle P = 60^\circ$ and the altitude from P to QR is of length 4.5 cm.

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2. Draw the graph of $y = x^2 + x$ and hence solve $x^2 + 1 = 0$.

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