MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

SAMPLE PAPER 18 (UNSOLVED)

Part I

1. Let f and g be two functions given by

$f = \{(0, 1), (2, 0), (3, -4), (4, 2), (5, 7)\}$

$g(x) = \{(0, 2), (1, 0), (2, 4), (-4, 2), (7, 0)$ then the range of

fog is ___.

    A. $\{0, 2, 3, 4, 5\}$

    B. $\{-4, 1, 0, 2, 7\}$

C. $\{1, 2, 3, 4, 5\}$

D. $\{0, 1, 2\}$

Answer:

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2. If 6 times of 6th term of an A.P. is equal to 7 times term, then the 13th term of the A.P. is

A. 0

B. 6

C. 7

D. 13

Answer:

3. 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 Geomteric progression

    B. an Arithmetic progression

    C. neither and Arithmetic progression nor a Geometric progression

    D. a contant sequence

Answer:

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. 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:

6. A tangent is perpendicular to the radius at the

A. centre

B. point of contact

C. infinity

D. chord

Answer:

7. If the slope of the line PQ is $\dfrac{1}{\sqrt{3}}$ then slope of the perpendicular bisector of PQ is

A. $\sqrt{3}$

B. $-\sqrt{3}$

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

D. 0

Answer:

8. A tower is 60 m height. Its show is x metres shorter when the sun's altitude is $45°$ than when it has been $30°$, then x is equal to

A. 41.92 m

B. 43.92m

C. 43 m

D. 45.6m

Answer:

9. The height and radius of the cone of which the frustum is a part are h^1 units and r_1 units respectively. Height of the

frustum is h_2 units and radius of the smaller base is r_2 units. If

$h_2 : h_1 = 1 : 2$ then $r_2 : r_1$ is

A. $1 : 3$

B. $1 : 2$

C. $2 : 1$

D. $3 : 1$

Answer:

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10. The sum of all deviations of the data from its mean is

A. always positive

B. always negative

C. zero

D. non-zero integer

Answer:

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11. The probability a red marble selected at random from a jar containing p red, q blue and r green marbles is

A. $\dfrac{q}{p + q + r}$

B. $\dfrac{p}{p + q + r}$

C. $\dfrac{p + q}{p + q + r}$

D. $\dfrac{p + r}{p + q + r}$

Answer:

12. The range of the relation $r = \{(x, x^2) \mid x$ is a prime number less than 13} is

A. {2,3,5,7,11}

B. {4,9,24,49,12}

C. {8,27,125,343,1331}

D. {1,8,27,125,343,1331}

Answer:

13. If α and β are roots of $ax^2 + bx + c = 0, a \neq = $ then the wrong statement is ....

A. $\alpha^2 + \beta^2 = \dfrac{b^2 - 2ac}{a^2}$

B. $\alpha\beta = \dfrac{c}{a}$

C. $\alpha + \beta = \dfrac{b}{a}$

D. $\dfrac{1}{\alpha} + \dfrac{1}{\beta} = \dfrac{-b}{c}$

Answer:

14. If AD is the bisector of $\angle A$ then AC is ....
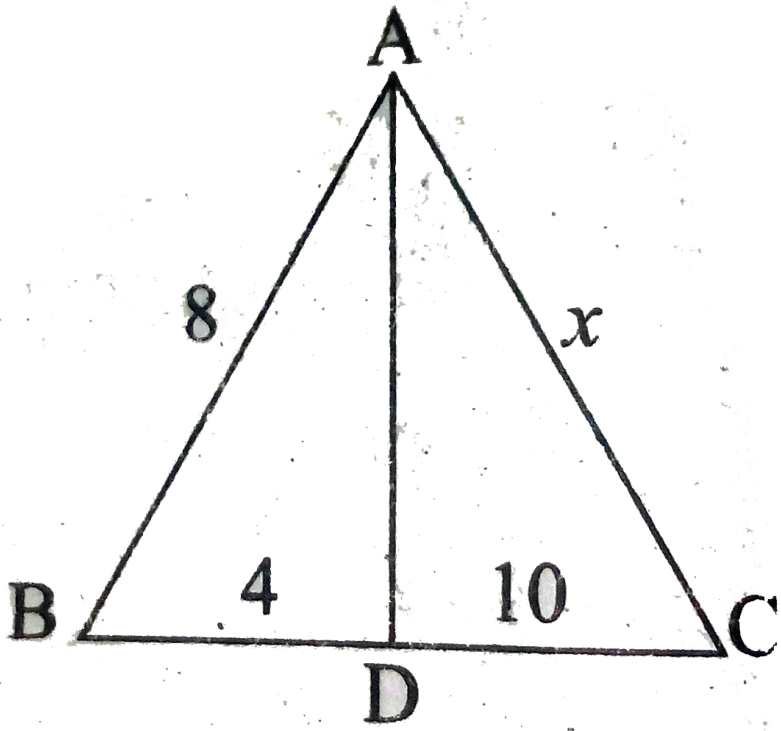
A. 12

B. 16

C. 18

D. 20

Answer:

Part Ii

1. Given the function $f : x \to x^2 - 5x + 6$, evaluate

f(-1)

    A. f(-1)

    B. f(2a)

    C. f(2)

    D. f(x-1)

Answer:

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

then find the first six terms of the sequence.

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3. Find the sum of 7 terms of the G.P. 1,-3,9,-27....

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4. Simplify $\dfrac{x + 4}{3x + 4y} \times \dfrac{9x^2 - 16y^2}{2x^2 + 3x - 20}$

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5. If the difference between the roots of the equation $x^2 - 13x + k = 0$ is 7 then the value of k is ___.

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

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

7. In a $\triangle ABC$, AD is the bisector of $\angle A$ meeting side BC at D, if AB=10 cm, AC =14 cm and BC=6 cm, find BD and DC.

8. Find the equation of a straight line

Passing through (-8, 4) and making equal intercepts on the coordinate axes.

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9. Prove that

$$\frac{\tan^2 \theta - 1}{\tan^2 \theta + 1} = 1 - 2\cos^2 \theta$$

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10. If the total surface area of a cone of radius 7 cm is $704cm^2$, then find its slant height .

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11. If $n = 5$, $\bar{x} = 6$, $\sum x^2 = 765$, then calculate the coefficient of variation.

12. A die is thrown twice . What is the probability that (i) 5 will not come up either time (ii) 5 will come up atleast once ?

13. The two tangents from an external points P to a circle with centre at O are PA and PB. If $\angle APB = 70°$ then the value of $\angle AOB$ is

14. Two A.Ps have the same common difference . The difference between their 100th term is 100 what is the difference between their 1000th term ?

Part Iii

1. Let A={6,9,15,18,21}, B={1,2,4,5,6} and $f: A \rightarrow B$ be defined by $f(x) = \dfrac{x - 3}{3}$

Represent f by , (i) an arrow diagram (ii) a set of ordered pairs (iii) a table (iv) a graph .

2. If f(x)=2x+3 , g(x)=1-2x and h(x)=3x. Prove that f o(g o h) = (f o g) o h

3. Find the sum of all odd integers less than 450.

4.   If

$$S_n = (x + y) + (x^2 + xy + y^2) + (x^3 + x^2y + y^2x + y^3) + \ldots n$$

terms   then   prove   that

$$(x - y)S_n = \left[\frac{x^2(x^n - 1)}{x - 1} - \frac{y^2y^n - 1}{y - 1} \right].$$

5. Find the GCD of

$6x^3 - 30x^2 + 60x - 48$ and $3x^3 - 12x^2 + 21x - 18$.

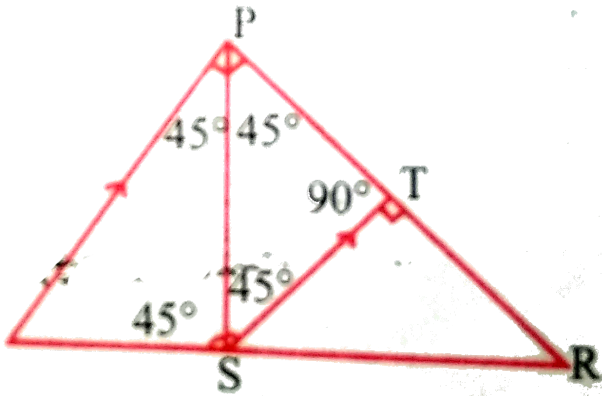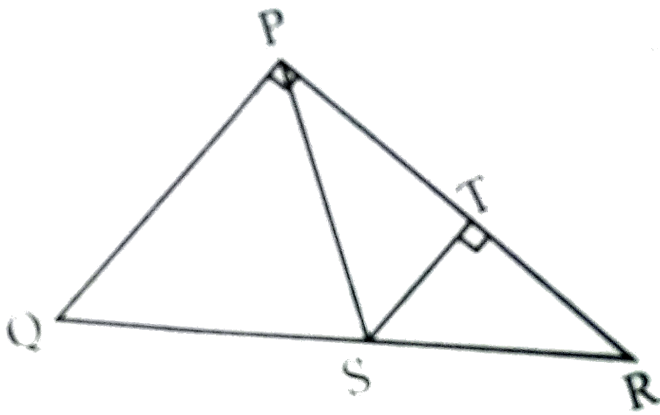**6.** Find the square root of the expressions

$$\frac{x^2}{y^2} - 10\frac{x}{y} + 27 - 10\frac{y}{x} + \frac{y^2}{x^2}$$

7. In figure $\angle QPC = 90°$, PS is its bisector. If $ST \perp PR$, prove that $ST \times (PQ + PR) = PQ \times PR$.

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8. Find the area of the quadrilateral whose vertices are at

$(- 9, 0), (- 8, 6), (- 1, - 2)$ and $(- 6, - 3)$

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9. From the top of a 12 m high building, the angle of elevation of the top of a cable tower is $60°$ and the angle of depression of its foot is $30°$. Determine the height of the tower .

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10. A hemi-spherical hollow bowl has material of volume $\dfrac{436\pi}{3}$ cubic cm. Its external diameter is 14 cm. Find its thickness.

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11. A coin is tossed thrice. Find the probability of getting exactly two heads or atleast one tail or two consecutive heads.

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12. Find X and Y if

$$2X + Y = \begin{pmatrix} 4 & 4 & 7 \\ 7 & 3 & 4 \end{pmatrix} \text{ and } X - 2Y = \begin{pmatrix} -3 & 2 & 1 \\ 1 & -1 & 2 \end{pmatrix}$$

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13. Find the standard deviation of the following distributions

x	70	74	78	82	86	90
f	1	3	5	7	8	12

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14. ABC is a right triangle , right angled at A and D is the mid point of AB . Prove that $BC^2 = CD^2 + 3BD^2$.

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1. Draw the graph of $y = x^2 - 4x + 4$ and hence solve $x^2 - 4x + 4 = 0$

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2. Draw the graph of $y = x^2 + x - 12$ and hence solve $x^2 + 2x + 2 = 0$

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