MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

SAMPLE PAPER 17 (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. Identity function

C. One-to-one function

D. Into function

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. If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + \ldots + 2^{0}$ which of the following is true?

A. B is 2^{64} more than A

B. A and B are equal

C. B is larger than A by 1

D. A is larger than B by 1

Answer:

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4. The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to

A. $\frac{16}{5}\left|\frac{x^2z^4}{y^2}\right|$

B. $16\left|\frac{y^2}{x^2z^4}\right|$

C. $\frac{16}{5}\left|\frac{y}{xz^2}\right|$

D. $\frac{16}{5}\left|\frac{xz^2}{y}\right|$

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:

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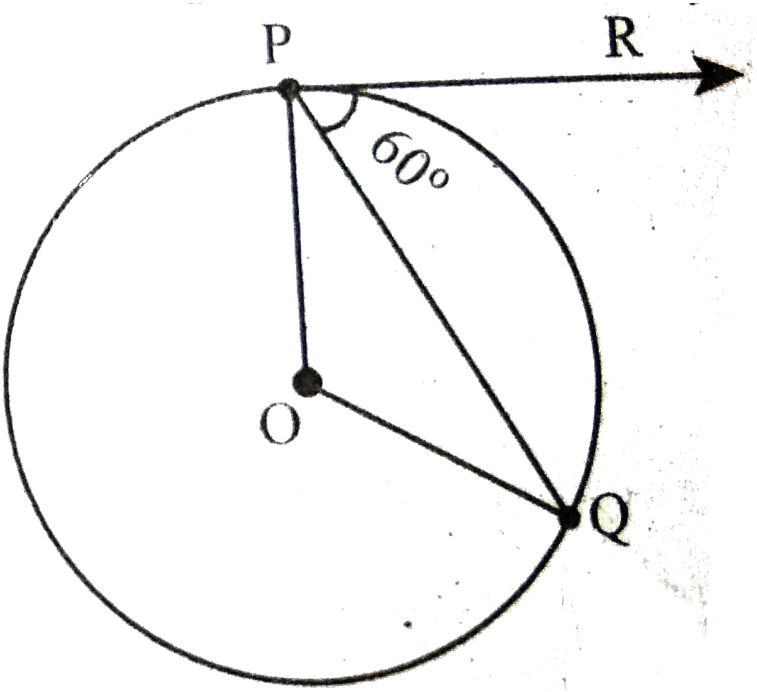
6. In figure if PR is tangent to the circle at P and O is the centre of the circle then $\angle POQ$ is



A. 120°

B. 100°

C. 110°

D. 90°

Answer:

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7. The straight line given by the equation $x = 11$ is

A. parallel to X axis

B. parallel to Y axis

C. passing through the origin

D. passing through the point (0,11)

Answer:

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8. If

$(\sin \propto + \cos ec \propto)^2 + (\cos \propto + \sec \propto)^3 = k + \tan^2 \propto + \cot^2 \propto$,

then the value of k=___.

A. 9

B. 7

C. 5

D. 3

Answer:

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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. Kamalam went to play a lucky draw contest. 135 tickets of the lucky draw were sold. If the probability of Kamalam winning is $\frac{1}{9}$, then the number of tickets bought by Kamalam is

A. 5

B. 10

C. 15

D. 20

Answer:

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12. If α and β are the roots of the equation $x^2 - 1 = 0$ then $\frac{2\alpha}{\beta} + \frac{2\beta}{\alpha}$ is equal to .....

A. 4

B. -4

C. -1

D. 1

Answer:

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13. The ordered pairs $(a+5, 3)(7, 3a+b)$ are equal then (a,b) is .....

A. (3,-2)

B. (-3,-2)

C. (-2,3)

D. (2,-3)

Answer:

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Part I I

1. If $f(x) = 3 + x, g(x) = x - 4$ show that fog=gof

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2. Given $A = \{1, 2, 3\}, B = \{2, 3, 5\}, C = \{3, 4\}$ and $D = \{1, 3, 5\}$, check $(A \cap C) \times (B \cap D) = (A \times B) \cap (C \times D)$ is true?

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3. Solve $5x = 4$ (mod 6)

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4. If $1 + 2 + 3 + \ldots + k = 325$, then find $1^3 + 2^3 + 3^3 + \ldots + k^3$.

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5. Find the square roots of

- 6 + 8i

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6. If $A = \begin{bmatrix} 2 & 5 \\ 4 & 3 \end{bmatrix}, B = \begin{bmatrix} 1 & -3 \\ 2 & 5 \end{bmatrix}$ find AB, BA and check if AB=BA?

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7. A vertical stick of length 6 m casts a shadow 400 cm long on the ground and at the same time a tower casts a shadow 28 m long.

Using similarity, find the height of the tower.

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8. Find the intercept made by the following lines on the coordinate axes.

$4x + 3y + 12 = 0$

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9. If the curved surface area of a solid hemisphere is 2772 sq. cm , find its total surface area .

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10. If the mean and coefficient of variation of a data are 15 and 48 respectively, then find the value of standard deviation.

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11. If $P(A) = \frac{2}{3}, P(B) = \frac{2}{5}, P(A \cup B) = \frac{1}{3}$ then find $P(A \cap B)$

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12. Prove that $\sqrt{\frac{\sec\theta - 1}{\sec\theta + 1}} = \frac{1 - \cos\theta}{\sin\theta}$

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13. Find a quadratic polynomial whose zero are $\frac{2 + \sqrt{5}}{2}$ and $\frac{2 - \sqrt{5}}{2}$

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14. If the straight lines $\frac{y}{2} = x - p$ and $ax + 5 = 3y$ are parallel , then find "a" .

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Part Iii

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

$f(x) = \{(6x + 1 \text{ if } -5 \leq x < 2)$, (5x^(2)-1" if "2lexlt6), (3x-4" if "6lexle9):}$F \in d$f(-3)+f(2)`

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2. Find the sum of 0.40 + 0.43 + 0.46 + ... + 1.

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3. 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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4. Find the square root of the following

$$\left(2x^2+\frac{17}{6}x+1\right)\left(\frac{3}{2}x^2+4x+2\right)\left(\frac{4}{3}x^2+\frac{11}{3}x+2\right)$$

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5. Solve for x, y, $\begin{bmatrix} x^2 \\ y^2 \end{bmatrix} + 2\begin{bmatrix} -2x \\ -y \end{bmatrix} = \begin{bmatrix} 5 \\ 8 \end{bmatrix}$

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6. State and prove Pythagoras theorem.

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7. Find the equation of a straight line through the intersection of lines $7x + 3y = 10, 5x - 4y = 1$ and parallel to the lines $13x + 5y + 12 = 0$.

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8. A bird is sitting on the top of a 80 m high tree. From a point on the ground, the angle of elevation of the bird is 45°. The bird flies away horizontallly in such away that it remained at a constant height from the ground. After 2 seconds, the angle

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9. A hollow metallic cylinder whose external radius is 4.3 cm and internal radius is 1.1 cm and whole length is 4 cm is melted and recast into a solid cylinder of 12 cm long. Find the diameter of solid cylinder.

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10. The mean and variance of seven observations are 8 and 16 respectively. If five of these are 2,4,10,12 and 14, then find the remaining two observations.

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11. In a class of 50 students , 28 opted for NCC , 30 opted for NSS and 18 opted both NCC and NSS. One of the students is selected at random . Find the probability that

(i) The student opted for NCC but not NSS .

(ii) The student opted for NSS but not NCC.

(iii) The student opted for exactly one of them .

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12. A motor boat whose speed is 18km/hr in still water takes 1hour more to go 24km upstream than to the return downstream to the same spot. Find the speed of the stream.

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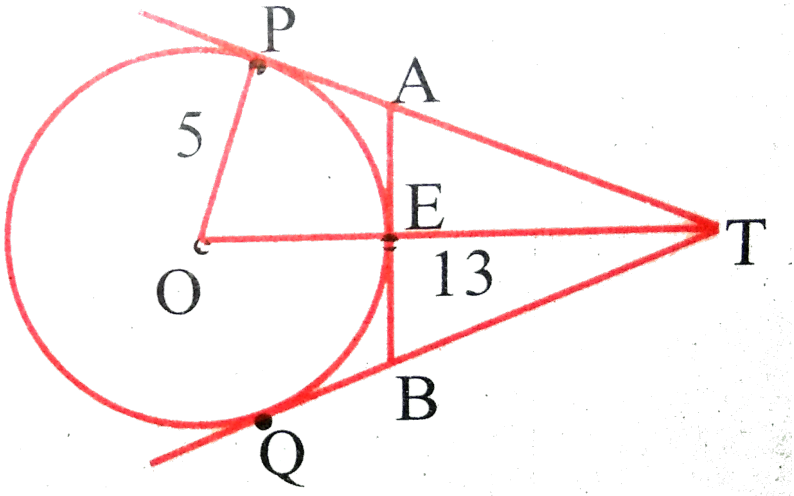
13. In figure, O is the centre of the circle with radius 5 cm. T is a point such that OT=13 cm and OT intersects the circle E, if AB is the tangent ot the circle at E, find the length of AB.



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14. A tent is made in the form of a conic frustum surmounted by a cone . The diameter of the base and the top of the frustum are 20 m and 6m respectively and the height is 24 m . If the height of the tent is 28 m , find the quantity of canvas required (Give your answer in π) .

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Part Iv

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

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