



MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

SAMPLE PAPER -15 (UNSOLVED)

Part I

1. If there are 1024 relations from a set $A = \{1, 2, 3, 4, 5\}$ to a set B, then the number

of elements in B is

A. 3

B. 2

C. 4

D. 8

Answer:



Watch Video Solution

2. The sum of the exponents of the prime factors in the prime factorization of 1729 is :

A. 1

B. 2

C. 3

D. 4

Answer:



Watch Video Solution

3. In an A.P., the first term is 1 and 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:



Watch Video Solution

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:



Watch Video Solution

5. Transpose of a columns matrix is

A. unit matrix

B. diagonal matrix

C. column matrix

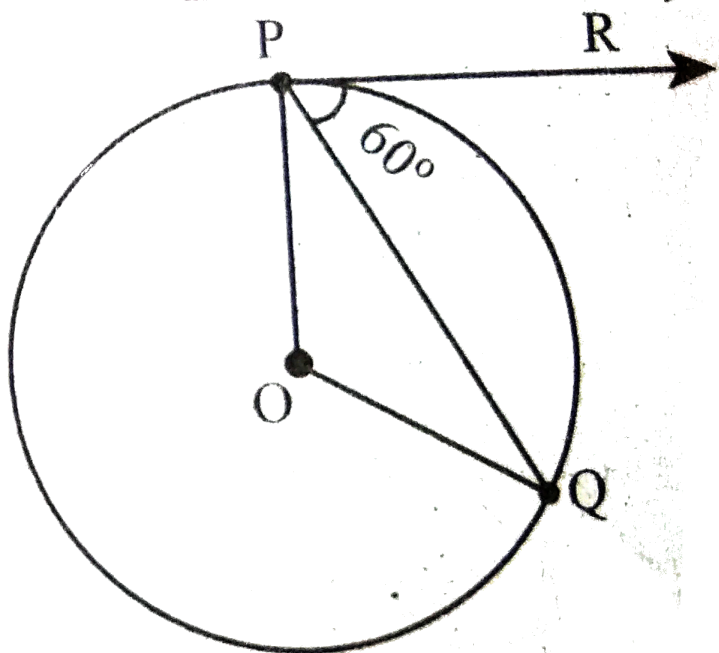
D. row matrix

Answer:



Watch Video Solution

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:



Watch Video Solution

7. When proving that quadrilateral is a trapezium it is necessary to show ____.

A. Two sides are parallel

B. Two parallel and two non-parallel sides .

C. Opposite sides are parallel.

D. All sides are or equal length .

Answer:



Watch Video Solution

8. The electric pole subtends an angle of 30° at a point on the same level as its foot. At a second point 'b' metres above the first, the depression of the foot of the tower is 60° . The height of the tower (in towers) is equal to

A. $\sqrt{3}b$

B. $\frac{b}{3}$

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

D. $\frac{b}{\sqrt{3}}$

Answer:



Watch Video Solution

9. The volume of the greatest sphere that can be cut off from a cylindrical log of wood of base radius 1 cm and height 5 cm is $\frac{4}{3}\pi$ (b)

$\frac{10}{3}\pi$ (c) 5π (d) $\frac{20}{3}\pi$

A. $\frac{4}{3}\pi$

B. $\frac{10}{3}\pi$

C. 5π

D. $\frac{20}{3}\pi$

Answer:



Watch Video Solution

10. The mean of 100 observations is 40 and their standard deviation is 3. The sum of all observation is ____.

A. 40000

B. 160900

C. 160000

D. 30000

Answer:



Watch Video Solution

11. The probability of getting a job for a person

is $\frac{x}{3}$. If the probability of not getting the job

is $\frac{2}{3}$ then the value of x is

A. 2

B. 1

C. 3

D. 1.5

Answer:



Watch Video Solution

12.

if

$$f(x) = x^2 - 2 \text{ then } f(x + 1) - f(x - 2)$$

.....

A. $3-6x$

B. $6x+3$

C. $-6x + 3$

D. $6x-3$

Answer:



Watch Video Solution

13. The roots of the equation $x^2 - 5x + 6 = 0$
are

- A. the roots are real and equal
- B. the roots are real and un equal
- C. the roots are unreal
- D. real and irrational

Answer: B



Watch Video Solution

1. In each of the following cases state whether the function is bijective or not. Justify your answer:

$$f: \mathbb{R} \rightarrow \mathbb{R} \text{ defined by } f(x) = 2x + 1$$



[Watch Video Solution](#)

2. A function $f: [1, 6) \rightarrow \mathbb{R}$ is defined as follows.

$$f(x) = \begin{cases} x + 1 & 1 \leq x < 2 \\ 2x - 1 & 2 \leq x < 4 \\ 3x^2 - 10 & 4 \leq x < 6 \end{cases}$$

Find the value of $f(5)$



[Watch Video Solution](#)

3. a and b are two positive integers such that

$$a^b \times b^a = 800. \text{ Find the a and b.}$$



[Watch Video Solution](#)

4. Find the 10^{th} term of a G.P. whose 8^{th} term

is 768 and the common ratio is 2 .



[Watch Video Solution](#)

5. Simplify

$$\left(\frac{p^2 - 10p + 21}{p - 7} \times \frac{p^2 + p - 12}{(p - 3)^2} \right)$$



[Watch Video Solution](#)

6. If the difference between a number and its reciprocal is $\frac{24}{5}$, find the number .



[Watch Video Solution](#)

7. If $A = \begin{pmatrix} \sqrt{7} & -3 \\ -\sqrt{5} & 2 \\ \sqrt{3} & -5 \end{pmatrix}$ then find the transpose of $-A$.



[Watch Video Solution](#)

8. If radii of two concentric circles are 4 cm and 5 cm, then length of each chord of one circle which is tangent to the other circle, is



[Watch Video Solution](#)

9. Find the value of 'a' , if the line through (-2,3) and (8,5) is perpendicular to $y=ax+2$.



[Watch Video Solution](#)

10. A road is flanked on either side by continuous rows of house of height $4\sqrt{3}$ m with no space in between them. A pedestrain is standing on the median of the road facing a row house. The angle of elevationn from the pedestrain to the top of the house is 30° .Find the width of the road.

 [Watch Video Solution](#)

11. The volumes of two cones of same base radius are 3600 cm^3 and 5040 cm^3 . Find the ratio of heights .

 [Watch Video Solution](#)

12. Find the standard deviation of the following data 18,20,15,12,25.

 [Watch Video Solution](#)

13. If one of the roots of the equation $3x^2 - kx - 2 = 0$ is 2. Find the value of k .
Also find the other roots.



Watch Video Solution

14. Prove that

$$\left(1 + \frac{1}{\tan^2 \theta}\right) \left(1 + \frac{1}{\cot^2 \theta}\right) = \sec^2 \theta \cdot \operatorname{cosec}^2 \theta$$



Watch Video Solution

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

$$f(x) = 3x + 2, \forall x \in N.$$

Find the images of 1, 2, 3



[Watch Video Solution](#)

2. If

$$f(x) = x - 4, g(x) = x^2 \text{ and } h(x) = 3x - 5$$

, show that the function is associative .



[Watch Video Solution](#)

3. The product of three consecutive terms of a Geometric Progression is 343 and their sum is $\frac{91}{3}$. Find the three terms .



[Watch Video Solution](#)

4. The sum of the three consecutive terms that are in A.P. is 27 and their product is 288. Find the three terms.



[Watch Video Solution](#)

5. The LCM and GCD of the two polynomials is

$(x^2 + y^2)(x^4 + x^2y^2 + y^4)$ and $x^2 - y^2$ one

of the polynomial $q(x)$ is

$(x^4 - y^4)(x^2 + y^2 - xy)$ find the other

polynomials.



[Watch Video Solution](#)

6. If $A = \begin{bmatrix} 5 & 2 & 9 \\ 1 & 2 & 8 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 7 \\ 1 & 2 \\ 5 & -1 \end{bmatrix}$ verify

that $(AB)^T = B^T A^T$.



[Watch Video Solution](#)

7. In $\triangle ABC$, with $\angle B = 90^\circ$, $BC=6$ cm and $AB=8$ cm, D is a point on AC such that $AD=2$ cm and E is the midpoint of AB . Join D to E and extend it to meet at F . Find BF .



[Watch Video Solution](#)

8. The line segment joining the mid-points of two sides of triangles is parallel to the third

side and is equal to ____ of its length.



[Watch Video Solution](#)

9. 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 horizontally in such away that it remained at a constant height from the ground. After 2 seconds, the angle



[Watch Video Solution](#)

10. In a study about viral fever, the number of people affected in a town were noted as

Age in years	0 - 10	10- 20	20- 30	30- 40	40- 50	50- 60	60- 70
Number of people affected	3	5	16	18	12	7	4

Find its standard deviation.



[Watch Video Solution](#)

11. A vessel is in the form of an inverted cone. Its height is 8 cm. and the radius of its top is 5 cm. It is filled with water up to the rim. When

lead shots, each of which is a sphere of radius 0.5cm are dropped into the vessel, $\frac{1}{4}$ of the water flows out. Find the number of lead shots dropped into the vessel.



[Watch Video Solution](#)

12. A jar contains 24 marbles , some are green and other are blue . If a marble is drawn, at random from the jar , the probability that it is green is $\frac{2}{3}$. Find the number of blue balls in the jar .



[Watch Video Solution](#)

13. The diagonal of a rectangular field is 60 metres more than the shorter side . If the longer side is 30 metres more than the shorter side , find the sides of the field .



[Watch Video Solution](#)

Part Iv

1. Draw the graph of $y = x^2 - 4$ and hence solve $x^2 - x - 12 = 0$.



Watch Video Solution