



# MATHS

## BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

### SAMPLE PAPER 19 (UNSOLVED)

#### Part I

1.  $f(x) = (x + 1)^3 - (x - 1)^3$  represents a functions  
which is

A. linear

B. cubic

C. reciprocal

D. quadratic

**Answer:**



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2. Given  $F_1 = 1$ ,  $F_2 = 3$  and  $F_n = F_{n-1} + F_{n-2}$

then  $F_5$  is

A. 3

B. 5

C. 8

D. 11

**Answer:**



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3. 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:**



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4. If  $(x-6)$  is the HCF of  $x^2 - 2x - 24$  and  $x^2 - kx - 6$  then the value of  $k$  is.

A. 3

B. 5

C. 6

D. 8

**Answer:**



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5. The solution of  $(2x - 1)^2 = 9$  is equal to

A.  $-1$

B.  $2$

C.  $-1, 2$

D. None of these

**Answer:**



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6. In a  $\triangle ABC$ ,  $AD$  is the bisector of  $\angle BAC$ . If  $AB=8$  cm,  $BD=6$  cm and  $DC=3$  cm. The length of the side  $AC$  is

A. 6 cm

B. 4 cm

C. 3 cm

D. 8 cm

**Answer:**



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7. The equation of a line passing through the origin and perpendicular to the line  $7x - 3y + 4 = 0$  is

A.  $7x - 3y + 4 = 0$

B.  $3x - 7y + 4 = 0$

C.  $3x + 7y = 0$

D.  $7x - 3y = 0$

**Answer:**



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8. The electric pole subtends an angle of  $30^\circ$  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  $60^\circ$ . 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:**



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9. 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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10. 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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11. Standard deviation of first 11 nature number is .....

A. 10

B. 3.15

C. 3.33

D. 11

**Answer:**



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12. If  $(a, 7)$ ,  $(2, b)$  represents an identify function then the value of a and b respectively are :

A. (6,7)

B. (-6,-7)

C. (7,6)

D. (7,7)

**Answer:**



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**13.** The square root of  $(x + 12)^2 - 48x$  is .....

A.  $|(x - 12)|^2$

B.  $|(x + 12)|^2$

C.  $|(12 - x)^2|$

D.  $|x - 12|$

**Answer:**



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**14.** The angle of elevation of the top of a hill at a point on the ground 130 m away from the foot of the tower is  $45^\circ$ . Then the height of the tower ( in meter ) is .....

A.  $130\sqrt{3}$

B.  $130m$

C.  $\frac{130}{\sqrt{2}}$

D.  $\frac{130}{\sqrt{3}}m$

**Answer:**

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**Part li**

1. If  $A = \{-2, -1, 0, 1, 2\}$  and  $f: A \rightarrow B$  is an onto function defined by  $f(x) = x^2 + x + 1$  then find B .

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2. Find the least number that is divisible by the first ten natural numbers.

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3. Find the sum of the following series

$$1 + 3 + 5 + \dots + 71$$

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4. Solve  $2m^2 + 19m + 30 = 0$

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5. Determine the nature of the roots for the following quadratic equations

$$9a^2b^2x^2 - 24abcdx + 16c^2d^2 = 0, a \neq 0, b \neq 0$$

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6. Given  $A = \begin{bmatrix} p & 0 \\ 0 & 2 \end{bmatrix}$ ,  $B = \begin{bmatrix} 0 & q \\ 1 & 0 \end{bmatrix}$ ,  $C = \begin{bmatrix} 2 & -2 \\ 2 & 2 \end{bmatrix}$

and If  $BA = C^2$ , find p and q.

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7. A tangent ST to a circle touches it at B. AB is a chord such that  $\angle ABT = 65^\circ$ , Find  $\angle AOB$ , where O is the



centre of the circle.



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8. Find the equation of a line passing through  $(6, -2)$  and perpendicular to the line joining the point  $(6, 7)$  and  $(2, -3)$ .



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9. Prove that following identities

$$\sec^6 \theta = \tan^6 \theta + 3 \tan^2 \theta \sec^2 \theta + 1$$



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**10.** The radius of a conical tent is 7 m and the height is 24 m . Calculate the length of the canvas used to make the tent if the width of the rectangular canvas is 4m ?



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**11.** The standard deviation and mean of a data are 6.5 and 12.5 respectively. Find the coefficient of variation.



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**12.** A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball double that of a

red ball determine the number of blue balls in the bag.



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**13.** How many multiples of 4 lies between 10 and 250 ?



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**14.** Find the value of  $k$  for which the quadratic equation

$(k + 4)x^2 + (k + 1)k + 1 = 0$  has equal roots



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1. Find the value of  $k$ , such that  $f \circ g = g \circ f$

$$f(x) = 3x + 2, g(x) = 6x - k$$



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2. A man repays a loan of ₹65,000 by paying ₹400 in the first month and then increasing the payment by ₹300 every month. How long will it take for him to clear the loan?



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3. Find the sum all natural numbers between 300 and 600 which are divisible by 7 .



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4. In an interschool atheletic meet , with 24 individual events , securing a total of 56 points , a first place secures 5 points , a second place secures 3 points , and a third place secures 1 point. Having a many third place finishers as first and second place finishers , find how many athletes finished in each place .



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5. 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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6. Let  $A = \begin{bmatrix} 1 & 2 \\ 1 & 3 \end{bmatrix}$ ,  $B = \begin{bmatrix} 4 & 0 \\ 1 & 5 \end{bmatrix}$ ,  $C = \begin{bmatrix} 2 & 0 \\ 1 & 2 \end{bmatrix}$  show

that

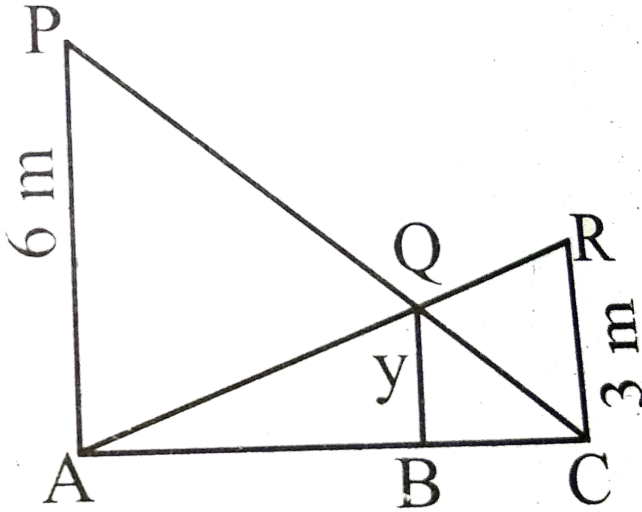
$$(A - B)C = AC - BC$$



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7. Two vertical poles of heights 6 m and 3 m are erected above a horizontal ground AC. Find the value

of  $y$ .



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8. Let  $P(11, 7)$ ,  $Q(13.9, 4)$  and  $R(9.5, 4)$  be the mid points of the sides  $AB$ ,  $BC$  and  $AC$  respectively of  $\triangle ABC$ . Find the coordinates of the vertices  $A$ ,  $B$ , and  $C$ . Hence

find the area of  $\triangle ABC$  and compare this with area of  $\triangle PQR$ .

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9. From the top of the tower 60 m high the angles of depression of the top and bottom of a vertical lamp post are observed to be  $38^\circ$  and  $60^\circ$  respectively. Find the height of the lamp post.

( $\tan 38^\circ = 0.7813$ ,  $\sqrt{3} = 1.732$ )

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**10.** A funnel consists of a frustum of a cone attached to a cylindrical portion 12 cm long attached at the bottom . If the total height be 20 cm , diameter of the cylindrical portion be 12 cm and the diameter of the top of the funnel be 24 cm . Find the outer surface area of the funne.



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**11.** The measurements of the diameters (in cm) of the plates prepared in a factory are given below. Find its

standard deviation.

<b>Diameter (cm)</b>	<b>21- 24</b>	<b>25- 28</b>	<b>29- 32</b>	<b>33- 36</b>	<b>37- 40</b>	<b>41- 44</b>
<b>Number of plates</b>	<b>15</b>	<b>18</b>	<b>20</b>	<b>16</b>	<b>8</b>	<b>7</b>



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12. The probability that a new car will get an award for its design is 0.25 , the probability that it will get an award for efficient use of fuel is 0.35 and the probability that it will get both the award is 0.15. Find the probability that (i) it will get atleast one of the two awards (ii) it will get only one of the awards



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**13.** Find the equation of the straight lines each passing through the point  $(6, -2)$  and whose sum of the intercepts is 5.

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**14.** Is it possible to design a rectangular park of perimeter 320m and area  $4800m^2$ ? If so find its length and breadth.

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1. Draw the graph of  $y = (x - 1)(x + 3)$  and hence solve  $x^2 - x - 6 = 0$ .



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2. Draw the graph of  $y = x^2$  and hence solve  $x^2 - 4x - 5 = 0$



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