MATHS

BOOKS - FULL MARKS MATHS (TAMIL ENGLISH)

SAMPLE PAPER -3

Part I

1. $A = \{a, b, p\}, B = \{2, 3\}, C = \{p, q, r, s\}$ then $n[(A \cup C) \times B]$ is

A. 8

B. 20

C. 12

D. 16

Answer:

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2. If a,b,c are in G.P then $\frac{a-b}{b-c}$ is equal to .....

A. $\frac{a}{b}$

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

C. $\frac{a}{c}$

D. $\frac{c}{b}$

Answer: B

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3. If $k+2, 4K-6, 3K-2$ are the 3 consecutive terms of an A,P, then value of K is .....

A. 2

B. 3

C. 4

D. 5

Answer: B

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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. 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:

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6. In a ΔABC, Adis 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

B. 4

C. 3

D. 8

Answer:

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7. $(2, 1)$ is the points of intersection of two lines

A. x -y-3=0: 3x-y-7=0

B. $X + y = 3 : 3x + y = 7$

C. $3x + y = 3, x + y = 7$

D. $x + 3y - 3 = 0, x - y - 7 = 0$

Answer:

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8. If the ratio of the height of a tower and the length of its shadow is $\sqrt{3} : 1$, then the angle of elevation of the sum had measure.

A. 45°

B. 30°

C. 90°

D. 60°

Answer:

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9. A spherical ball of radius r_1 units is melted to make 8 new identical balls each of radius r_2 units. Then $r_1 : r_2$ is

A. $2:1$

B. $1:2$

C. $4:1$

D. $1:4$

Answer:

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10. The standard deviation of a data is 3 . If each value is multiplled by 5 then the new variance is

A. 3

B. 15

C. 5

D. 225

Answer:

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11. A page is selected at random from a book. The probability that the digit at units place of the page number chosen is less than 7 is

A. $\frac{3}{10}$

B. $\frac{7}{10}$

C. $\frac{3}{9}$

D. $\frac{7}{9}$

Answer:

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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. $(4, 9, 25, 49, 121\}$

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

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

Answer:

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13. If $1 + 2 + 3 \ldots\ldots + n = k$ then$1^3 + 2^3 + \ldots\ldots\ldots n^3$ is equal to .....

A. k^2

B. k^3

C. $\frac{k(k+1)}{2}$

D. $(k+1)^3$

Answer:

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14. Two dice are thrown simultaneously. The probability of getting a doublet is _____.

A. $\frac{1}{36}$

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

C. $\frac{1}{6}$

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

Answer:

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Part Ii

1. A Relation R is given by the set $\{(x, y) \mid y = x + 3, \xi n\{0, 1, 2, 4, 5\}\}$. Determine its domain and range.

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2. Let $f = \{(-1, 3\}, (0, -1), (2, -9)\}$ be linear function from Z into Z. Find f(x).

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3. Solve $8x = -1$ (mod 11)

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4. How many terms of the series $1^3 + 2^3 + 3^3 + \ldots$ should be taken to get the sum 14400?

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5. Given the LCM and GCD of the two polynomials p(x) and q(x) find the unknownn polynomial in the following table

S. No	LCM	GCD	$p(x)$	$q(x)$
(i)	$a^3 - 10a^2 + 11a + 70$	$a - 7$	$a^2 - 12a + 35$	
(ii)	$(x^2 + y^2)(x^4 + x^2y^2 + y^4)$	$(x^2 - y^2)$		$(x^4 - y^4)(x^2 + y^2 - xy)$

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6. Find the square root of the following

$9x^2 - 24xy + 30xz - 40yz + 25z^2 + 16y^2$

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7. Construct a 3×3 matrix whose elements are $a_{ij} = i^2 j^2$

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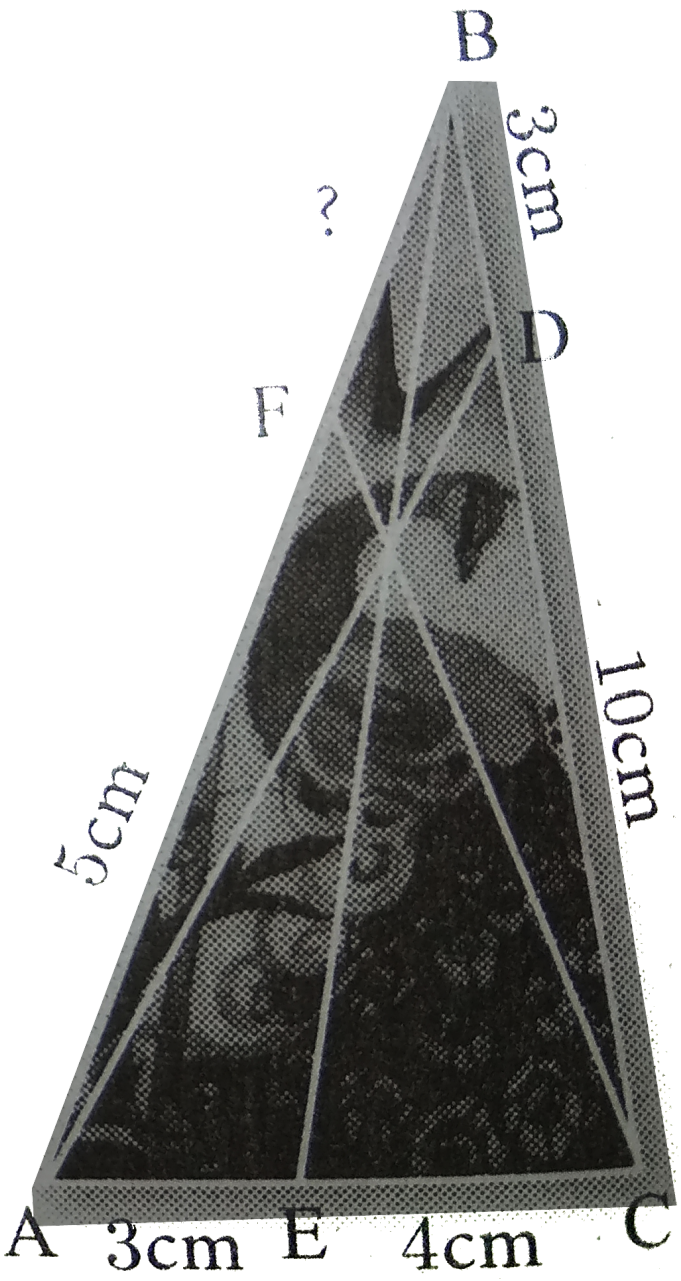
8. An artist has created a triangular stained glass window and has one strip of small length left before completing the window. She needs to figure out the length of left out portion based on

the lengths of the other sides as shown in the figure .



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9. Find the area of the triangle whose vertices are (-3,5) , (5,6) , (5, -2)

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10. From the top of a rock $50sqr(3)$ m high, the angle of depression of car on the ground is observed to be 30°. Find the distance of the car from the rock.

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

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12. The roots of the equation $x^2 + 6x - 4 = 0$ are α, β. Find the quadratic equation whose roots area

$\frac{2}{\alpha}$ and $\frac{2}{\beta}$

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13. If the points A(2,5) ,B(4,6) and C(8,a) are collinear find the value of 'a' using slope concept .

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14. The king, Queen and Jack of clubs are removed from a deck of 52 playing cards and the remaining cards are shuffled. A card is

drawn from the remaining cards. Find the probability of getting

(i) a card of clubs (ii) a queen of diamond

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Part Iii

1. Find x if

$g(f(f(x))) = f(g(g(x)))$, given $f(x) = 3x + 1$ and $g(x) = x + 3$

.

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2. Let $A = \{-1, 1\}$ and $B = \{0, 2\}$. If the functions $f: A \to B$ defined by $f(x) = ax + b$ is an onto function? Find a and b.

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3. Priya earned ₹15,000 in the first month. Therefore her salary inceased by ₹1500 per year. Her expenses are ₹13,000 during the first year and the expenses inceases by ₹900 per year. How long will it take for her to save ₹20,000 per month.

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4. Find the sum to n terms of the series

$0.4 + 0.44 + 0.444 + \ldots$.to n terms.

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5. If the roots of the equation $(c^2 - ab)x^3 - 2(a^2 - bc)x + b^2 - ac = 0$ are real and equal prove that either $a = 0$ (or) $a^3 + b^3 + c^3 = 3abc$.

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6. ABCD is a quadrilateral in which AB= AD, the bisector of $\angle BAC$ and $\angle CAD$ intersect the sides BC and CD at the points E and F respectively. Prove that EF || BD.

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7. Find the equation of a straight line

Passing through (1, -4) and has intercepts which are in the ratio 2:5

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8. If $\frac{\cos\theta}{1+\sin\theta} = \frac{1}{a}$ then prove that $\frac{a^2-1}{a^2+1} = \sin\theta$.

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

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10. 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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11. A tent is in the shape of a cylinder surmounted by a conical top. If the heigh and diameter of the cylinder part are 2.1 m and 4m. And slant heigh of the top is 2.8m, find the area of the canvas used for making the tent. Also find the cost of canves of the tent at the rate of Rs 500 per m^2.

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12. Seven year ago, Varun's age was five times the square of swati's age. Three years hence Swati's age will be two fifth of Varun's age. Find their present ages.

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13. Construct a ΔPQR in which QR= 5 cm, $P = 40^\circ$ and the median PG from P to QR is 4.4 cm. Find the length of the altitude from P to QR.

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14. Draw the two tangents from a point which is 5 cm away from the centre of a circle of diameter 6 cm. Also, measure the lengths of the tangents.

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

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

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