



SOLVED PRACTICE PAPER - 2

SUBJECT: MATHEMATICS



CLASS: X

PART – A

SECTION – I ($6 \times 2 = 12$) **1.** If A and B are disjoint sets, then how can you find n (AUB)? Answer: By definition of disjoint set we mean that there won't be any common elements in both the sets. \Rightarrow n(A \cap B)=0 In general, $n(A \cup B) = n(A) + n(B) - n(A \cap B)$ Since A and B are disjoint sets, $n(A \cap B)=0$ $n(A \cup B) = n(A) + n(B)$ 2. Write the formula of nth term of G.P. and explain the terms in it. Answer: $a_n = a r^{n-1}$ a is the first term of GP r is the common ratio n is the no. of terms of GP a_n is the nth term of GP 3. Find the volume of the right circular cone with a radius 6 cm and height 7 cm. Answer: Here. r=6cm and h=7cm Volume of right circular cone = $\frac{1}{3}\pi$ r²h $= \frac{1}{3} \times \frac{22}{7} \times 6 \times 6 \times 7$ $= \frac{1}{3} \times 22 \times 36$ =264 cm³ 4. Calculate Answer: $\frac{1-\tan^2 45}{1+\tan^2 45} = \frac{1-(1)^2}{1+(1)^2} = \frac{0}{1} = 0$ 5. Write two examples for equally likely events. Answer: Tossing a coin. => Head and tails have equal chances. Rolling a dice. => All faces have equal chances. 6. The product of two consecutive positive integers is 306. Find the integers **Answer:** Let two consecutive numbers are x and (x + 1)product of x and (x + 1) = 306

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10. From an external point, two tangents are drawn to a circle. A line joining the external point and the center of the circle bisects the angle between the tangents. Is this true or not? Justify your answer.

Answer:

It Is true,

Let PQ and PR are two tangents drawn from a point P exterior of the circle with centre O join OQ and OR

in \triangle OQP and \triangle OQR

OQ = OR(radii of the same circle)

 $\angle OQP = \angle ORP = 90^{\circ}$

OP = OP (common side)

By RHS congruency

 $\Delta \text{ OQP} \cong \Delta \text{ OQR}$

 $\angle OPQ = \angle OPR$ (by CPCT)

 \therefore OP is the angle bisector of \angle QPR

Hence, A line joining the external point and the center of the circle bisects the angle between the tangents.

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11. What is the probability of a number picked from first twenty natural numbers is even composite number?

Answer:

The composite even numbers up to 20 are-4,6,8,10,12,14,16,18,20 Total number of even composite numbers up to 20=9 Therefore, Total number of possible outcomes =20 No. of favourable outcomes =9

: Probability of selecting a even composite number = $\frac{9}{20}$

12. Find the median of the first 6 prime numbers.

Answer:

The first 6 prime numbers are 2, 3, 5, 7, 11 and 13.

Total number of observations, n = 6 (Even)

Median = (Value of 3rd observation + Value of 4th observation)/2

$$=(5+7)/2$$

= 12/2 ∴Median = 6



SECTION – III $(4 \times 6 = 24)$ 13. Use Euclid's division lemma to show that the square of any positive integer of the form 5n, 5n + 1 or 5n + 4Answer: Let 'a' be any positive integer and b = 5. Using Euclid Division Lemma, a = bq + r $[0 \le r < b]$ \Rightarrow a = 5q + r [$0 \le r < 5$] ~S.C Now, possible value of r : r = 0, r = 1, r = 2, r = 3, r = 4 CASE I: If we take, r = 0 $\Rightarrow a = 5q + 0$ \Rightarrow a = 5q On squaring both sides; $\Rightarrow a^2 = (5q)^2$ $\Rightarrow a^2 = 25q^2$ $\Rightarrow a^2 = 5 (5q^2)$ \Rightarrow a² = 5n. [Here, n = 5q²] CASE II: If we take, r = 1 \Rightarrow a = 5q + 1 On squaring both sides; $\Rightarrow a^2 = (5q + 1)^2$ $\Rightarrow a^2 = 25q^2 + 10q + 1$ $\Rightarrow a^2 = 5(5q^2 + 2q) + 1$ \Rightarrow a² = 5n + 1 [Here, n = 5q² + 2q_ CASE III: If we take, r = 2 $\Rightarrow a = 5q + 2$ On squaring both sides; $\Rightarrow a^2 = (5q + 2)^2$ $\Rightarrow a^2 = 25q^2 + 20q + 4$ $\Rightarrow a^2 = 5(5q^2 + 4q) + 4$ \Rightarrow a² = 5n + 4 [Here, n = 5q² + 4q] CASE IV : If we take, r = 3 $\Rightarrow a = 5q + 3$ On squaring both sides; $\Rightarrow a^2 = (5q + 3)^2$ $\Rightarrow a^2 = 25q^2 + 30q + 5 + 4$ $\Rightarrow a^2 = 5(5q^2 + 6q + 1) + 4$ $\Rightarrow a^2 = 5n + 4$ [Here, $n = 5q^2 + 6q + 1$] CASE V: If we take, r = 4 \Rightarrow a = 5q + 4 On squaring both sides;



 $\Rightarrow a^{2} = (5q + 4)^{2}$ $\Rightarrow a^{2} = 25q^{2} + 40q + 15 + 1$ $\Rightarrow a^{2} = 5(5q^{2} + 8q + 3) + 1$ $\Rightarrow a^{2} = 5n + 1 [Here, n = 5q^{2} + 8q + 3]$ Hence, the square of any integer is either of the form 5m, 5m+1 or 5m+4 for some integer m.

14. Draw the graph of $p(x) = x^2 - 2x - 8$ and find the zeroes of the polynomial from it. **Answer:**

Let $y = x^2 - 2x - 8$



The polynomial $f(x) = x^2 - 2x - 8 = (x - 4) (x + 2)$ is factorizable into two distinct linear factors (x - 4) and (x + 2). So, the parabola cuts X-axis at two distinct points (4, 0) and (-2, 0). the x-coordinates of these points are zeros of f(x). \therefore the solution is x = -2 or x = 4 **15.** Find the roots of the quadratic Equation $5x^2 - 7x - 6 = 0$ by "completing squaring" method? **Answer:**

Given equation is $5x^2 - 7x - 6 = 0$ $5x^2 - 7x = 6$ Dividing in both sides oy 5 $x^2 - \frac{7}{5}x = \frac{6}{5}$ ----- (1) $2xy = \frac{7}{5}x$ $y = \frac{7}{10}$





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Chose the correct answer $20 \times 1=20$ The exponential form of $\log_a \sqrt{x^4} = y$ $a) a^y = x^4$ $b) y^a = 4$ $c) a^y = x^2$ $d) x^y = a^2$ $d) $	PART	- B		
The exponential form of $\log_a \sqrt{x^4} = y$ (c) a) $a^y = x^4$ (c) $y^a = 4$ (c) $a^y = x^2$ (d) $x^y = a^2$ The number of subsets of the null set is (f) and (f) A and B are two disjoint sets and n (A) = 6, n(B) = 5, then n (A \cup B) = (d) a) 5 (b) 6 (c) 30 (d) 11 (c) (d) (d) 11 an a division, if divisor is (x + 1), quotient is 'x' and remainder is '4', then dividend is (c) a) $x^2 + x$ (c) $x(x + 1) + x$ (c) $x(x + 1) + 4$ (c) $4x + 4$ Solution for the equations $\sqrt{3}x + \sqrt{5}y = 0$ and $\sqrt{7}x + \sqrt{11}y = 0$ (c) a) $x = 0, y = 0$ (b) $x = 5, y = 3$ (c) $x = 3, y = 5$ (d) $x = 0, y = 3$ (f) $x^2 + x$ (c) $x = 4, y = 16$ has infinite solutions, then the value of p' is (c) a) $x = 0, y = 0$ (b) $x = 5, y = 3$ (c) $x = 3, y = 5$ (d) $x = 0, y = 3$ (f) $x + 3y = 8$ and $4x + py = 16$ has infinite solutions, then the value of p' is (c) a) $a = 0, y = 0$ (c) $1 (d) 3$ (d) 16 The value of x in the equation $3x - (x - 4) = 3x + 1$ is (c) $a = -3$ (c) -3 (c) -1 (d) 3 The sum of a number and its reciprocal is $\frac{17}{4}$, then the number is (c) $a = -3$ (c) -3 (d) -4 (d) $11 = -7, x, \frac{-7}{2}$ are in G. P. then the value of x is (c) $a = -52$ is (c) $a = -52$ is (c) $a = -52$ (c) -3 (d) -4 (d) $11 = -7, x, \frac{-7}{2}$ are in G. P. then the value of x is (c) $a = -52$ (c) -3 (d) -4 (d) $11 = -7, x, \frac{-7}{2}$ are in G. P. then the value of x is (c) $a = -3, 3 = -52$ is (c) $a = -3, 3 = -32$ (c) $-3, 3 = -32$ (Chose the correct answer		20 ×	1=20
a) $a^{y} = x^{4}$ b) $y^{a} = 4$ c) $a^{y} = x^{2}$ d) $x^{y} = a^{2}$ The number of subsets of the null set is a) 1 b) 0 c) 3 d) 4 If A and B are two disjoint sets and n (A) = 6, n(B) = 5, then n (A \cup B) = a) 5 b) 6 c) 30 d) 11 a division, if divisor is (x + 1), quotient is 'x' and remainder is '4', then dividend is a) $x^{2} + x$ b) $4(x + 1) + x$ c) $x(x + 1) + 4$ d) $4x + 4$ Solution for the equations $\sqrt{3}x + \sqrt{5}y = 0$ and $\sqrt{7}x + \sqrt{11}y = 0$ (a a) $x^{2} + x$ b) $4(x + 1) + x$ c) $x(x + 1) + 4$ d) $4x + 4$ Solution for the equations $\sqrt{3}x + \sqrt{5}y = 0$ and $\sqrt{7}x + \sqrt{11}y = 0$ (a a) $x = 0, y = 0$ b) $x = 5, y = 3$ c) $x = 3, y = 5$ d) $x = 0, y = 3$ If $2x + 3y = 8$ and $4x + py = 16$ has infinite solutions, then the value of 'p is a) 8 b) 6 c) 10 d) 16 The value of x in the equation $3x - (x - 4) = 3x + 1$ is a) -3 b) 0 c) 1 d) 3 The sum of a number and its reciprocal is $\frac{17}{4}$, then the number is (b a) 3 b) 4 c) 5 d) 7 The common difference of an AP in which $a_{25} - a_{12} = -52$ is (d) a) -1 b) -2 c) -3 d) -4 (d) -4 b) If $\frac{-2}{7}, x, \frac{-7}{2}$ are in G.P. then the value of x is a) 5 b) 35 c) 65 d) 50 2. If the slope of a line is '1, then the angle between the line and X - axis is a) 2 b) 1 c) 0 d) 3 5. Base area of prism is 30 cm ² and its height is 10 cm. Then the volue of prism is (a a) 2 b) 44; 41 c) 7; 4 d) 4; 7 c) 10 d) 34; 5. Base area of prism is 30 cm ² and its height is 10 cm. Then the volue of prism is (a a) 30 cm ³ b) 300 cm ² c) 150 cm ³ d) 150 cm ³ b) 450 c) 10 cm ³ d) 150 cm ³ c) 150 cm ³ d) 150 cm ³ d) 30 cm ² d) 150 cm ³ c) 160 d) 90 ⁰ c) HP(E) ≥ 1 b) P(E) ≤ 0 c) $0 < P(E) < 1$ d) $0 \le P(E) \le 1$ d) $\sqrt{1 - \cos^2 \theta}$ b) $\sqrt{1 + \tan^2 \theta}$ c) $\tan^2 \theta - 1$ d) $\sin^2 \theta - 1$ c) Unimodal data may have modes a) 0 b) 1 c) 2 d) 3 d) 30	The exponential form of $\log_a \sqrt{x^4} = y$			(c)
The number of subsets of the null set is a) 1 b) 0 c) 3 d) 4 If A and B are two disjoint sets and n (A) = 6, n(B) = 5, then n (A \cup B) = a) 5 b) 6 c) 30 d) 11 In a division is fdivisor is (x + 1), quotient is 'x' and remainder is '4', then dividend is a) x ² + x b) 4(x + 1) + x c) x(x + 1) + 4 d) 4x + 4 Solution for the equations $\sqrt{3x} + \sqrt{5y} = 0$ and $\sqrt{7x} + \sqrt{11y} = 0$ (a a) x = 0, y = 0 b) x = 5, y = 3 c) x = 3, y = 5 d) x = 0, y = 3 If 2x + 3y = 8 and 4x + py = 16 has infinite solutions, then the value of 'p' is a) 8 b) 6 c) 10 d) 16 The value of x in the equation $3x - (x - 4) = 3x + 1$ is a) -3 b) 0 c) 1 d) 3 The sum of a number and its reciprocal is $\frac{17}{4}$, then the number is a) 3 b) 4 c) 5 d) 7 The common difference of an AP in which $a_{25} - a_{12} = -52$ is (a) -1 b) -2 c) 3 d) -4 . If $\frac{-2}{7}$, x, $\frac{-7}{2}$ are in G.P. then the value of x is a) 2 b) 1 c) 0 d) 3 . Sum of first 10 natural numbers is a) 3 S b) 4 c) 5 d) 50 . If the slope of a line is '1', then the angle between the line and X - axis is a) 3 3 b) 4 d) 4 c) 7 c) 0 d) 3 . Ratio of areas of two similar triangles is 144 : 441, then the ratio of their perimeter is (a) 14 : 41 b) 44 : 41 c) 7 : 4 d) 4 : 7 . The number of tangents that can be drawn to the circle from an external point is a) 300 cm ² b) 45 c) c) 1 d) 3 . Base area of prism is 30 cm ² and its height is 10 cm. Then the volue of prism is (a) 300 cm ² c) 150 cm ² d) 150 cm ³ . Laddu is an example of a) cylinder b) sphere c) cone d) cube . sec $0 =$ a) $\sqrt{1 - \cos^2 \theta}$ b) $\sqrt{1 + \tan^2 \theta}$ c) $\tan^2 \theta - 1$ d) $\sin^2 \theta - 1$. If the shadow of a tree is $\frac{1}{3}$ times the height of the tree, then the angle of elevation of sun is (c a) 300 b) 45^0 c) 60^0 d) 90^0 . If P(E) is the probability of an event, then a) $\sqrt{1 - \cos^2 \theta}$ b) $\sqrt{1 + \tan^2 \theta}$ c) $\cos 0 \le 9(E) < 1$ d) $0 \le P(E) \le 1$. Unimodal data may have modes a) 0 b) b) 1 c) 2 d) 3	a) $a^y = x^4$ b) $y^a = 4$	c) $a^{y} = x^{2}$	d) $x^y = a^2$	
$ \begin{aligned} & \text{If } A \text{ and } B \text{ are two disjoint sets and n (A) = 6, n(B) = 5, then n (A ∪ B) = (d) 4 \\ & \text{(a) } 5 & \text{(b) } 6 & \text{(c) } 30 & \text{(d) } 11 \\ & \text{(c) } a \text{(d) } s (d$	The number of subsets of the null set is	c) 2	d) 4	(a)
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