

# Andhra Pradesh SSC Class 10th Maths Question Paper 1 With Solution 2019

QUESTION PAPER CODE 15E(A)

## SECTION - I

(4 \* 1 = 4)

**Question 1:** Write  $A = \{2, 4, 8, 16\}$  in set-builder form.

**Solution:**

$$A = \{2^n / n \in \mathbb{N}, \text{ and } n < 5\}$$

**Question 2:** Find the value of  $\log_5 \sqrt{625}$ .

**Solution:**

$$\begin{aligned} & \log_5 \sqrt{625} \\ &= \log_5 25 \\ &= \log_5 5^2 \\ &= 2 \log_5 5 \\ &= 2 * 1 \\ &= 2 \end{aligned}$$

**Question 3:** The larger of two supplementary angles exceeds the smaller by  $58^\circ$ , then find the angles.

**Solution:**

Let the required supplementary angles be  $x$  and  $y$ .

$$x + y = 180^\circ \text{ ---- (1)}$$

The larger angle exceeds the smaller by  $58^\circ$ .

$$x - y = 58^\circ \text{ ---- (2)}$$

Solve (1) and (2),

$$2x = 238$$

$$x = 238 / 2$$

$$x = 119^\circ$$

$$y = 61^\circ$$

**Question 4: Find the curved surface area of the cylinder, whose radius is 7cm and height is 10cm.**

**Solution:**

Radius of the cylinder ( $r$ ) = 7cm

Height of the cylinder ( $h$ ) = 10cm

The curved surface area of the cylinder =  $2\pi rh$

$$= 2 * (22 / 7) * (7) * (10)$$

$$= 440 \text{ cm}^2$$

## SECTION - II

(5 \* 2 = 10)

**Question 5: Rohan's mother is 26 years older than him. The product of their ages after 3 years will be 360. Then write the required quadratic equation to find Rohan's present age.**

**Solution:**

Let Rohan's present age be  $x$  years.

His mother's age at present is  $(x + 26)$  years.

After 3 years, Rohan's age =  $(x + 3)$  years

After 3 years, his mother's age =  $(x + 26) + 3 = (x + 29)$  years

The product of their ages =  $(x + 3)(x + 29)$

$$= x * x + x * 29 + 3 * x + 3 * 29$$

$$= x^2 + 29x + 3x + 87$$

$$= x^2 + 32x + 87$$

By the sum, the product of their ages is 360

$$x^2 + 32x + 87 = 360$$

$$x^2 + 32x + 87 - 360 = 0$$

$x^2 + 32x - 273 = 0$  is the required quadratic equation.

**Question 6: Find the zeroes of the quadratic polynomial  $x^2 - x - 30$  and verify the relation between the zeroes and its coefficients.**

**Solution:**

Given the polynomial  $x^2 - x - 30$ ,

To find the zeros,  $x^2 - x - 30 = 0$  [say]

$$= x^2 - 6x + 5x - 30$$

$$= x(x - 6) + 5(x - 6)$$

$$= (x + 5)(x - 6)$$

$$x = -5 \text{ and } x = 6$$

$$\text{Sum of the zeroes} = 6 + (-5)$$

$$= 1$$

$$= (-1) / 1$$

$$= -(\text{coefficient of } x) / (\text{coefficient of } x^2)$$

$$\text{Product of the zeroes} = 6(-5)$$

$$= -30$$

$$= (-30) / 1$$

$$= (\text{constant term}) / (\text{coefficient of } x^2)$$

**Question 7: A joker's cap is in the form of a right circular cone, whose base radius is 7cm and height is 24cm. Find the area of the sheet required to make 10 such caps.**

**Solution:**

Base radius of the conical cap ( $r$ ) = 7cm

Height ( $h$ ) = 24cm

$$\text{Slant height (l)} = \sqrt{r^2 + h^2}$$

$$= \sqrt{7^2 + 24^2}$$

$$= \sqrt{49 + 576}$$

$$= \sqrt{625}$$

$$= 25 \text{ cm}$$

Area of sheet required to make a cap = Lateral surface area of the cap

$$= \pi r l$$

$$\begin{aligned} &= (22 / 7) * 7 * 25 \\ &= 550 \text{ sq.cm} \end{aligned}$$

Area of sheet required to 10 such caps

$$\begin{aligned} &= 10 * 550 \\ &= 5500 \text{ sq.cm} \end{aligned}$$

**Question 8: Find the HCF of 1260 and 1440 by using Euclid's division lemma.**

**Solution:**

The given numbers are 1260 and 1440.

$$1440 = 1260 * 1 + 180$$

$$1260 = 180 * 7 + 0$$

HCF of 1440 and 1260 is 180.

**Question 9: If the sum of the first 15 terms of an AP is 675 and its first term is 10, then find 25<sup>th</sup> term.**

**Solution:**

First-term of an AP =  $a = 10$

Let the common difference be  $d$ .

Sum of the first 15 terms is  $S_{15} = 675$

$$(15 / 2) * [2a + 14d] = 675$$

$$[2 * 10] + 14d = (675 * 2) / 15$$

$$14d = 90 - 20 = 70$$

$$d = 70 / 14$$

$$d = 5$$

25<sup>th</sup> term of an AP is  $a_{25} = a + 24d$

$$= 10 + 24 * 5$$

$$= 10 + 120$$

$$= 130$$

**SECTION - III**

**Question 10:**

**[a] Show that  $2 + 5\sqrt{3}$  is irrational.**

**OR**

**[b] Check whether -321 is a term of the AP 22, 5, 8, 1.....**

**Solution:**

[a] Let us assume the contrary that  $2 + 5\sqrt{3}$  is rational that is coprime can be found for 'a' and 'b' and  $b \neq 0$  such that

$$2 + 5\sqrt{3} = (a / b)$$

$$5\sqrt{3} = (a / b) - 2$$

$$\sqrt{3} = (a / 5b) - (2 / 5)$$

Since  $(a / 5b)$  and  $(2 / 5) \in \mathbb{Q}$ ,  $(a / 5b) - (2 / 5) \in \mathbb{Q}$ .

So,  $\sqrt{3}$  is rational.

But this contradicts the fact that  $\sqrt{3}$  is irrational.

So, our assumption that  $2 + 5\sqrt{3}$  is rational is wrong.

So,  $2 + 5\sqrt{3}$  is irrational.

[b] From the given AP, 22, 15, 8, 1 .....

$$a = 22, d = -7$$

$$n^{\text{th}} \text{ term of an AP} = a_n = a + (n - 1)d$$

In this AP, let the  $n^{\text{th}}$  term be -321

$$a + (n - 1)d = -321$$

$$22 + (n - 1)(-7) = -321$$

$$(n - 1)(-7) = -343$$

$$n - 1 = (-343) / (-7)$$

$$n = 49 + 1$$

$$n = 50$$

Hence, -321 will be the 50<sup>th</sup> term in the given AP.

**Question 11:**

**[a] In a class test, the sum of Moulika's marks in mathematics and English is 30. If she got 2 marks more in mathematics and 3 marks less in English, the product of her marks would have been 210. Find her marks in the two subjects.**

**OR**

**[b] An oil drum is in the shape of the cylinder, whose diameter is 2m and height is 7m. The painter charges Rs. 5 per  $m^2$  to paint the drum. Find the total charges to be paid to the painter for 10 drums.**

**Solution:**

[a] Given that the sum of Moulika's marks in Mathematics and English is 30.

Let the marks of Moulika in Mathematics be  $x$  and that of in English be  $30 - x$ .

If she got 2 marks more in mathematics then marks in maths =  $x + 2$

And she got 3 marks less in English then the marks in English =  $30 - x - 3 = 27 - x$

Product of these two =  $(x + 2)(27 - x) = 210$

$$x^2 - 25x + 156 = 0$$

$$(x - 12)(x - 13) = 0$$

$$x = 12, 13$$

Case (i) If  $x = 12$ , the marks of Moulika in

Mathematics = 12

English =  $30 - 12 = 18$

Case (ii) If  $x = 13$ , the marks of Moulika in

Mathematics = 13

English =  $30 - 13 = 17$

[b] The diameter of the oil drum which is in the shape of cylinder =  $d = 2m$

The radius of the drum =  $r = d / 2 = 2 / 2 = 1m$

Height =  $h = 7m$

Total surface area of the drum which is in the shape of cylinder =  $2\pi r (r + h)$

$$= 2 * (22 / 7) * (1) * (1 + 7)$$

$$= 2 * (22 / 7) * 8$$

= 50.28 sq.m

Charges to paint the drum per sq.m = Rs. 5

The total cost of painting 10 such type of drums =  $50.28 * 5 * 10 = \text{Rs. } 2514$

**Question 12:**

(i) [a] If  $A = \{x : x \text{ is a natural number less than } 6\}$ .

$B = \{x : x \text{ is a prime number which is a divisor of } 60\}$ .

$C = \{x : x \text{ is an odd natural number less than } 10\}$ .

$D = \{x : x \text{ is an even natural number which is a divisor of } 48\}$ .

Then write the roster form for all the above sets and find

[a]  $A \cup B$

[b]  $B \cap C$

[c]  $A - D$

[d]  $D - B$

OR

(ii) 6 pencils and 4 notebooks together cost Rs. 90 whereas 8 pencils and 3 notebooks together cost Rs. 85. Find the cost of one pencil and that of one notebook.

**Solution:**

(i) [a]  $A = \{1, 2, 3, 4, 5\}$

$B = \{2, 3, 5\}$

$C = \{1, 3, 5, 7, 9\}$

$D = \{2, 4, 6, 8, 12, 14, 16, 24, 48\}$

[a]  $A \cup B = \{1, 2, 3, 4, 5\} \cup \{2, 3, 5\} = \{1, 2, 3, 4, 5\}$

[b]  $B \cap C = \{2, 3, 5\} \cap \{1, 3, 5, 7, 9\} = \{3, 5\}$

[c]  $A - D = \{1, 2, 3, 4, 5\} - \{2, 4, 6, 8, 12, 14, 16, 24, 48\} = \{1, 3, 5\}$

[d]  $D - B = \{2, 4, 6, 8, 12, 14, 16, 24, 48\} - \{2, 3, 5\} = \{4, 6, 8, 12, 16, 24, 48\}$

(ii) Let the cost of one pencil be Rs. x.

Cost of one notebook = Rs. y.

The total cost of 6 pencils and 4 notebooks = Rs. 90

$$6x + 4y = 90 \text{ ---- (1)}$$

The total cost of 8 pencils and 3 notebooks = Rs. 85

$$8x + 3y = 85 \text{ ---- (2)}$$

On solving the above two equations,  $x = 5$ ,  $y = 15$ .

The cost of one pencil = Rs. 5

The cost of one notebook = Rs. 15

**Question 13:**

[a] Find the zeroes of the quadratic polynomial  $p(x) = x^2 + x - 20$  using the graph.

OR

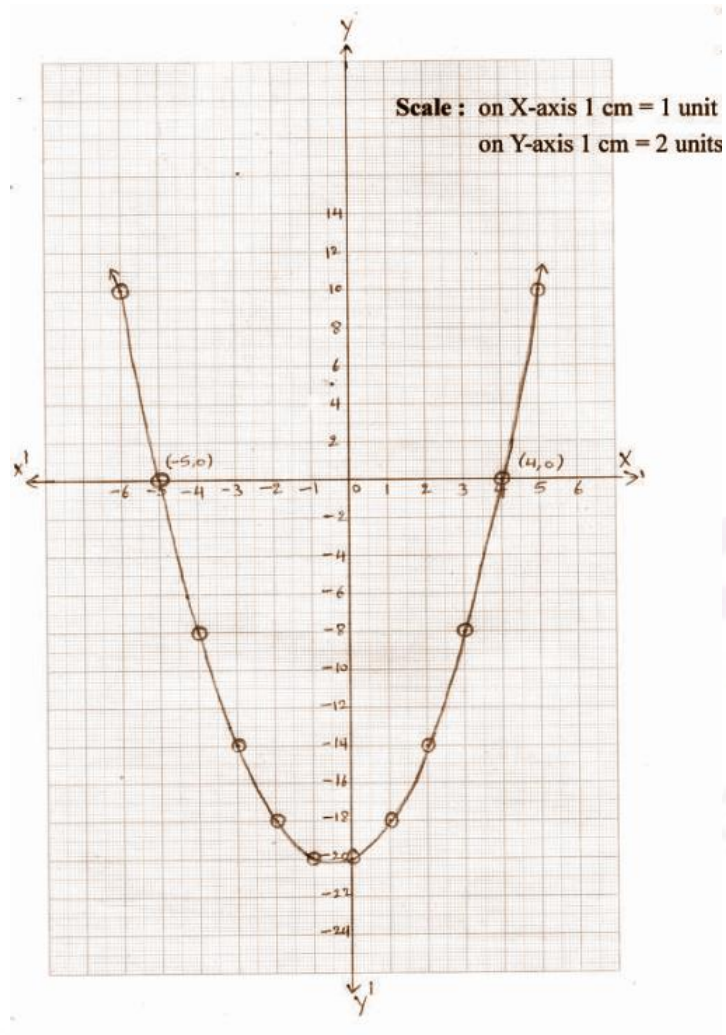
[b] Solve the following pair of linear equations graphically.

$$2x + y + 4 \text{ and } 2x - 3y = 12.$$

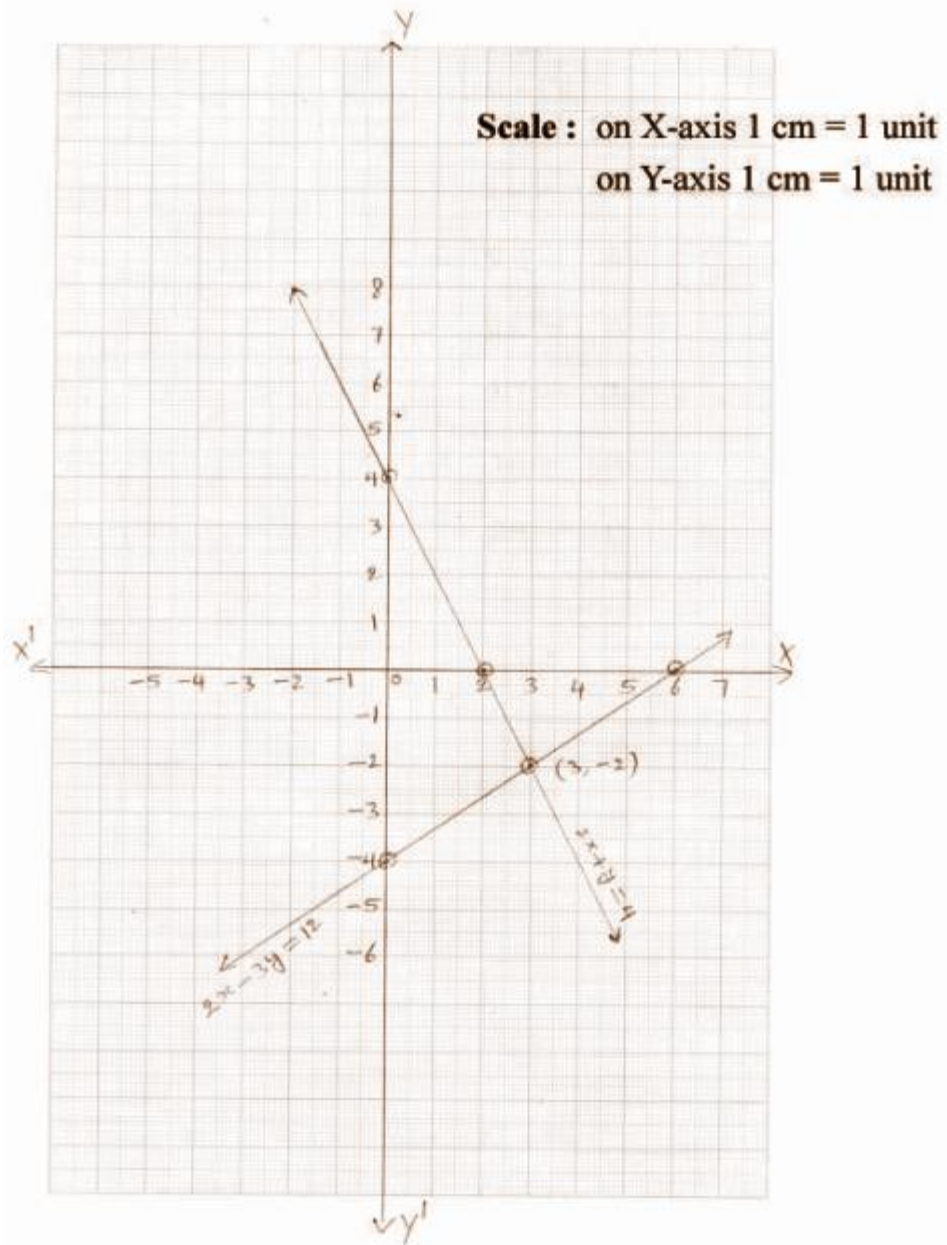
**Solution:**

[a] Let  $y = x^2 + x - 20$





[b]



**SECTION - IV**

(20 \* 0.5 = 10)

**Question 14:** If  $n(A) = 8$ ,  $n(B) = 3$ ,  $n(A \cap B) = 2$ , then  $n(A \cup B)$

= \_\_\_\_\_

- (A) 5      (B) 7      (C) 9      (D) 13

**Answer: C**

**Question 15:** The discriminant of  $6x^2 - 5x + 1 = 0$  is \_\_\_\_\_  
(A) 1      (B) 2      (C) 6      (D)  $(-5 / 6)$

**Answer: A**

**Question 16:** Sum of the zeroes of the polynomial  $x^2 + 5x + 6 = 0$  is  
(A) 5      (B) -5      (C) 6      (D)  $(5 / 6)$

**Answer: B**

**Question 17:** Which of the following is not irrational?  
(A)  $\sqrt{2}$       (B)  $\sqrt{3}$       (C)  $\sqrt{4}$       (D)  $\sqrt{5}$

**Answer: C**

**Question 18:** One root of the equation  $x - (3 / x) = 2$  is \_\_\_\_\_  
(A) 1      (B) 2      (C) 3      (D) 4

**Answer: C**

**Question 19:** If 4, a, 9 are in GP, then a = \_\_\_\_\_  
(A) 6      (B)  $\pm 6$       (C) 7      (D)  $\pm 7$

**Answer: B**

**Question 20:** If the total surface area of a cube is  $96\text{cm}^2$ , then its volume is \_\_\_\_\_  
(A)  $32\text{cm}^3$       (B)  $64\text{cm}^3$       (C)  $128\text{cm}^3$       (D)  $256\text{cm}^3$

**Answer: B**

**Question 21:**  $\log_{10} 0.001 =$  \_\_\_\_\_  
(A) 2      (B) 3      (C) -2      (D) -3

Answer: D

Question 22: Match the following.

If  $a, b, c$  are the zeroes of a cubic polynomial  $ax^3 + bx^2 + cx + d = 0$ , then

- [i]  $a + b + c$                       [a]  $(-d / a)$   
[ii]  $ab + bc + ca$                 [b]  $(c / a)$   
[iii]  $abc$                             [c]  $(-b / a)$

- (A) [i] - c, [ii] - b, [iii] - a  
(B) [i] - a, [ii] - b, [iii] - c  
(C) [i] - b, [ii] - a, [iii] - c  
(D) [i] - c, [ii] - a, [iii] - b

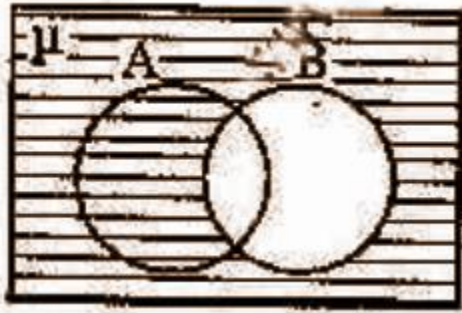
Answer: A

Question 23: The next term in AP  $\sqrt{3}, \sqrt{12}, \sqrt{27}, \dots$

- (A)  $\sqrt{32}$                       (B)  $\sqrt{36}$                       (C)  $\sqrt{42}$                       (D)  $\sqrt{48}$

Answer: D

Question 24: The shaded region in the figure shows



- (A)  $A - B$                       (B)  $B - A$                       (C)  $\mu - B$                       (D)  $A \cup B$

Answer: C

Question 25:  $5x - 3$  represents \_\_\_\_\_ polynomial.

- (A) Linear degree      (B) Quadratic      (C) Cubic      (D) Fourth degree

Answer: A

- Question 26: The common difference in AP  $\log_2 2, \log_2 4, \log_2 8 \dots$  is  
(A) 1      (B) 2      (C) 3      (D) 4

Answer: A

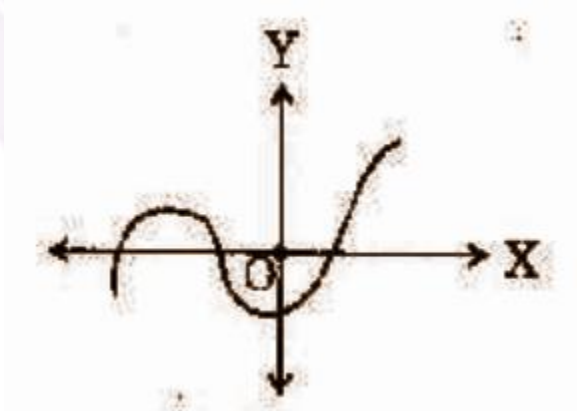
- Question 27: The sum of the first 'n' odd natural numbers is \_\_\_\_\_  
(A) n      (B)  $n^2$       (C)  $n(n + 1)$       (D)  $n(n + 1) / 2$

Answer: B

- Question 28: The quadratic polynomial, whose zeroes are  $\sqrt{2}$  and  $-\sqrt{2}$  is \_\_\_\_  
(A)  $x^2 - 2$       (B)  $x^2 + 2$       (C)  $x^2 + \sqrt{2}$       (D)  $x - 2$

Answer: A

- Question 29: The number of zeroes of the polynomial in the graph is \_\_\_\_\_



- (A) 0      (B) 1      (C) 2      (D) 3

Answer: D

**Question 30:** The line  $2x - 3y = 8$  intersects x-axis at

- (A) (2, -3)      (B) (0, -3)      (C) (2, 0)      (D) (4, 0)

**Answer: D**

**Question 31:** The volume of the cone, whose radius is 3cm and height is 8cm, is \_\_\_\_\_  $\text{cm}^3$ .

- (A)  $6\pi$       (B)  $12\pi$       (C)  $18\pi$       (D)  $24\pi$

**Answer: D**

**Question 32:** If  $6x + 2y + 9 = 0$  and  $kx + y - 7 = 0$  has no solution, then  $k =$

- \_\_\_\_\_      (A) 3      (B) 2      (C) -3      (D) -2

**Answer: A**

**Question 33:** If the equation  $x^2 + 5x + k = 0$  has real and distinct roots, then

- \_\_\_\_\_      (A)  $k = 6$       (B)  $k < 6.25$       (C)  $k > 6$       (D)  $k > 25$

**Answer: B**