

## IX - Maths Quarterly - 2024

I Choose the most appropriate answer

1. b) n(B)
2. b) A=B
3. d) 0, 10
4. a) 1
5. a) 10
6. d)  $\pi$
7. d)  $3\sqrt{5}$
8. b)  $\frac{4}{3}$
9. b)  $8\sqrt{2}$
10. c)  $-\frac{3}{2}$
11. ~~a) 7~~ d) 6
12. ~~b) x+y~~ c)  $x^3+y^3$
13. b)  $(-a-b+c)^2$
14. b) Interior Opposite angle

$$19) 0.\overline{3}$$

$$x = 0.\overline{3}$$

$$x = 0.333\dots \text{--- (1)}$$

$$10x = 3.333\dots \text{--- (2)}$$

$$\text{(2) - (1)}$$

$$10x - x = 3.333\dots - 0.333\dots$$

$$9x = 3$$

$$x = \frac{3}{9}$$

$$x = \frac{1}{3}$$

$$20) (243)^{\frac{2}{5}}$$

$$= (3^5)^{\frac{2}{5}}$$

$$= 3^2$$

$$= 9$$

$$25) (x+2y+3z)^2$$

$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$$

$$= x^2 + 4y^2 + 9z^2 + 4xy + 12yz + 6xz$$

$$26) \text{Factorize: } 2x^2 + 15x + 27$$

$$54 = 2x^2 + 18x + 3x + 27$$

$$= 2x(x+9) + 3(x+9)$$

$$= (2x+3)(x+9)$$

$$21) \angle A = \angle D = 53'$$

(~~Yes~~ Alternate Interior angles are Equal)

In  $\triangle ECD$

$$x^\circ + 38^\circ + \angle D = 180^\circ$$

$$x^\circ + 38^\circ + 53^\circ = 180^\circ$$

$$x^\circ = 180^\circ - 91^\circ = 89^\circ$$

$$\text{II } A = \{I, N, D, A\}$$

$$\text{(15) } B = \{M, I, S, P\}$$

$$21) 5\sqrt{3} + 18\sqrt{3} - 2\sqrt{3}$$

$$= 5\sqrt{3} + 16\sqrt{3}$$

$$= 21\sqrt{3}$$

$$28) A - B = \{-3, -2\}$$

$$B - A = \{0, 2\}$$

$$16) \{ \{ \}, \{1\}, \{2\}, \{3\} \}$$

$$\{ \{1, 2\}, \{2, 3\}, \{3, 1\} \}$$

$$\{ \{1, 2, 3\} \}$$

$$22)$$

$$i) 3.459 \times 10^6$$

$$= 3459000$$

$$ii) 5.678 \times 10^4$$

$$= 56780$$

$$17) n[P(A)] = 256$$

$$n[P(A)] = 2^m = 2^8$$

$$m \Rightarrow n(A) = 8$$

$$23)$$

$$x + \sqrt{2}x^2 - 5x^3 - \frac{7}{2}x^4$$

$$18) (P \cup Q) = \{1, 2, 3, 5, 7, 9, 11\}$$

$$(P \cup Q) \cup R = \{1, 2, 3, 4, 5, 6, 7, 9, 11\}$$

$$24) (1001)^3$$

$$(1000+1)^3 = 1000^3 + 3(1000)^2(1) + 3(1)(1000) + 1^3$$

$$= 1000000000 + 3000000 + 3000 + 1$$

$$= 1003003001$$

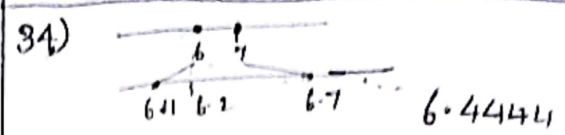
- 29) i)  $A' = \{0, 2, 4, 6\}$   
 ii)  $B' = \{1, 4, 6\}$   
 iii)  $A' \cup B' = \{0, 1, 2, 4, 6\}$   
 iv)  $A' \cap B' = \{4, 6\}$   
 v)  $(A \cup B)' = \{4, 6\}$

30)  $A \cup (B \cap C) = (A \cup B) \cap C$   
 L.H.S  $(B \cap C) = \{m, n, p, q, s, t\}$   
 $A \cup (B \cap C) = \{m, n, p, q, r, s, t\}$  ——— ①  
 R.H.S  $(A \cup B) = \{m, n, p, q, r, s, t\}$   
 $(A \cup B) \cap C = \{m, n, p, q, s, t\}$  ——— ②  
 L.H.S = R.H.S

31)  $A = \{-1, 0, 1, 2, 3, 4\}$   
 $B = \{0, 1, 2, 3, 4, 5\}$   
 $C = \{-4, -1, 0, 2, 3, 4\}$   
 $(B \cap C) = \{-4, -1, 0, 1, 2, 3, 4, 5\}$   
 $A \cap (B \cap C) = \{-1, 0, 1, 2, 3, 4\}$   
 R.H.S  $(A \cap B) = \{0, 1, 2, 3, 4\}$   
 $(A \cap C) = \{-1, 0, 2, 3, 4\}$   
 $(A \cap B) \cup (A \cap C) = \{-1, 0, 1, 2, 3, 4\}$

32)  $U = \{1, 2, 3, 4, \dots, 10\}$   $n(U) = 10$   
 $A = \{2, 3, 4, 8, 10\}$   $B = \{1, 2, 5, 8, 10\}$   
 $n(A) = 5$  ,  $n(B) = 5$   
 $(A \cup B) = \{1, 2, 3, 4, 5, 8, 10\}$   $n(A \cup B) = 7$   
 $(A \cap B) = \{2, 8, 10\}$   $n(A \cap B) = 3$   
 $n(A \cup B) = n(A) + n(B) - n(A \cap B)$   
 $7 = 5 + 5 - 3$   
 $7 = 10 - 3$   
 $7 = 7$   
 It's verified.

33)   $\sqrt{9 \cdot 3} = \sqrt{27} = 3.1$



35)  $\frac{1}{2} \sqrt[3]{8 \times 5} + 3 \sqrt[3]{125 \times 5} - 4 \sqrt[3]{64 \times 5}$   
 $= 2 \times 2 \sqrt{5} + 3 \times 5 \sqrt{5} - 4 \times 4 \sqrt{5}$   
 $= 4 \sqrt{5} + 15 \sqrt{5} - 16 \sqrt{5}$   
 $= 3 \sqrt{5}$

36)  $x = \sqrt{5} + 2$  ,  ~~$\frac{1}{x} = \sqrt{5} - 2$~~   
 ~~$\frac{1}{x} = \sqrt{5} - 2$~~   
 $\frac{1}{x} = \sqrt{5} - 2$   
 $(x + \frac{1}{x}) = (x + \frac{1}{x})^2 - 2x(\frac{1}{x})$   
 $= (\sqrt{5} + 2 + \sqrt{5} + 2)^2 - 2$   
 $= (2\sqrt{5})^2 - 2$   
 $= (4 \times 5) - 2$   
 $= 18$

37)  $\frac{(3.0 \times 10^{-5})^6 \times (5.0 \times 10^{-5})^4}{(9.0 \times 10^{-3})^3 \times (5.0 \times 10^{-2})^2}$   
 $= \frac{3^6 \times 10^{-30} \times 5^4 \times 10^{-20}}{9^3 \times 5^2 \times 10^{-6} \times 10^{-4}}$   
 $= 3^6 \times 3^{-6} \times 5^4 \times 5^{-2} \times 10^{-50} \times 10^{10}$   
 $= 3^0 \times 5^2 \times 10^{-40}$   
 $= 25 \times 10^{-37}$   
 $= 2.5 \times 10^{-36}$

38)  $(2x^4 + 4x^2 - 3x + 7) - p(x) = 3x^3 - x^2 + 2x + 1$   
 $p(x) = 2x^4 + 4x^2 - 3x + 7 - 3x^3 - x^2 - 2x - 1$   
 $p(x) = 2x^4 - 3x^3 + 5x^2 - 5x + 6$

39) i)  $f(x) = 2x + 1$  | ii)  $f(x) = 3x - 5$   
 $f(x) = 0$  |  $f(x) = 0$   
 $2x + 1 = 0$  |  $3x - 5 = 0$   
 $x = -1/2$  |  $x = 5/3$

$$(40). P(x) = x^3 - 2x^2 - 4x - 1$$

$$P(-1) = 0$$

$$g(x) \Rightarrow x + 1 = 0$$

$$x = -1$$

$$P(-1) = (-1)^3 - 2(-1)^2 - 4(-1) - 1$$

$$= -1 - 2(1) + 4 - 1$$

$$= 4 - 4$$

$$P(-1) = 0$$

Remainder = 0

$$41) a + b + c = 0 \text{ then}$$

$$a^3 + b^3 + c^3 = 3abc$$

$$a + b + c = 7 - 10 + 3$$

$$= 10 - 10$$

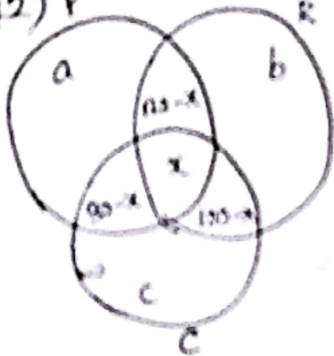
$$a + b + c = 0$$

$$\therefore 7^3 - 10^3 + 3^3 = 3(7)(-10)(3)$$

$$= 63(-10)$$

$$= -630$$

42) P



$$a = 600 - (120 - x + 80 - x + x)$$

$$a = 600 - (200 - x)$$

$$a = 400 + x$$

$$b = 130 + x$$

$$c = 100 + x$$

$$x + a + b + c + 120 - x + 130 - x + 80 - x + x = 1000$$

$$\Rightarrow 930 + x = 1000$$

$$x = 1000 - 930 = 70$$

$$x = 70$$

$\therefore$  70 farmers grew all the three crops.