

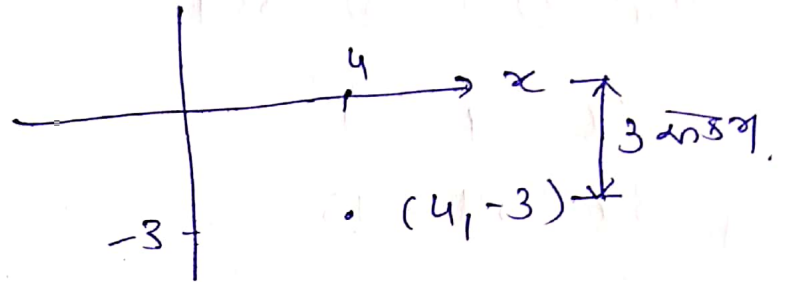
વિભાગ - A

1) ૨

૨) A) (1, 0)

૩) કાનાજી નક્ષત્ર $d = \frac{1}{2} - \frac{3}{2} = \frac{1-3}{2} = -\frac{2}{2} = -1$

4) ૩ એકમ



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વિભાગ - B

૬) $x^2 - 3$ બહુપદી $\rightarrow ax^2 + bx + c = 0$ માટે દર્શાવવાળી

$$P(x) = x^2 - 3 = 0 \quad \begin{matrix} a = 1 \\ b = 0 \\ c = -3 \end{matrix}$$

$$x^2 - (\sqrt{3})^2 = 0 \quad c = -3$$

$$(x - \sqrt{3})(x + \sqrt{3}) = 0 \quad (\because a^2 - b^2 = (a - b)(a + b))$$

$$x - \sqrt{3} = 0 \text{ અથવા } x + \sqrt{3} = 0$$

$$x = \sqrt{3} \text{ અથવા } x = -\sqrt{3}$$

$$\text{એટલે કે } \alpha = \sqrt{3} \quad \beta = -\sqrt{3}$$

$$\alpha + \beta = \sqrt{3} + (-\sqrt{3}) = 0$$

$$\alpha \cdot \beta = (\sqrt{3}) \cdot (-\sqrt{3}) = -3$$

$$\left| \begin{array}{l} -\frac{b}{a} = \frac{0}{1} = 0 \\ \frac{c}{a} = \frac{-3}{1} = -3 \end{array} \right.$$

$$\text{તથા } \alpha + \beta = -\frac{b}{a}$$

$$\alpha \cdot \beta = \frac{c}{a}$$

6)

$$x + y = 5 \quad \text{--- ①}$$

$$2x - 3y = 4 \quad \text{--- ②}$$

ધાન ① ને 3 વડે ગુણાવતા

$$3x + 3y = 15 \quad \text{--- ③}$$

ધાન ② + ③ કરતા

$$2x - 3y = 4$$

$$+ \quad 3x + 3y = 15$$

$$5x = 19$$

$$\boxed{x = \frac{19}{5}}$$

$x = \frac{19}{5}$ ની કિંમત ધાન ① માં મૂકતા

$$\frac{19}{5} + y = 5$$

$$\therefore y = 5 - \frac{19}{5} = \frac{25 - 19}{5} = \frac{6}{5}$$

આમ ઉકેલ $(x, y) = \left(\frac{19}{5}, \frac{6}{5}\right)$

$$7) \quad 34 + 32 + 30 + \dots + 10$$

$$a = 34$$

$$d = 32 - 34 = -2$$

$$a_n = 10$$

$$\therefore a_n = a + (n-1)d$$

$$\therefore 10 = 34 + (n-1)(-2)$$

$$\therefore 10 - 34 = (n-1)(-2)$$

$$\therefore \frac{-24}{-2} = (n-1)$$

$$\therefore n-1 = 12$$

$$\therefore n = 12 + 1 = 13$$

$$S_n = \frac{n}{2} [2a + (n-1)d]$$

$$= \frac{13}{2} [2(34) + (13-1)(-2)]$$

$$= \frac{13}{2} [68 + (-24)]$$

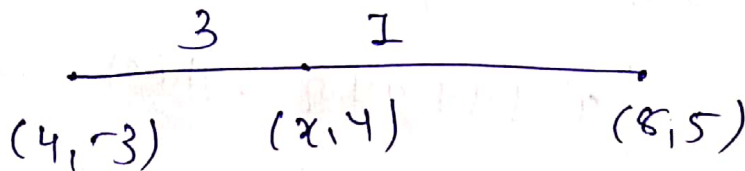
$$= \frac{13}{2} [68 - 24]$$

$$= \frac{13}{2} [44]$$

$$= 13 \times 22$$

$$= 286$$

8)



$$m_1 : m_2 = 3 : 1$$

$$(x, y) = \left(\frac{m_1 x_2 + m_2 x_1}{m_1 + m_2}, \frac{m_1 y_2 + m_2 y_1}{m_1 + m_2} \right)$$

$$= \left(\frac{3 \times 8 + 1 \times 4}{3 + 1}, \frac{3 \times 5 + 1 \times (-3)}{3 + 1} \right)$$

$$= \left(\frac{24 + 4}{4}, \frac{15 - 3}{4} \right)$$

$$= \left(\frac{28}{4}, \frac{12}{4} \right) = (7, 3)$$

ପିଲାଟି-୯

୨)

$$\begin{array}{r} 3x - 5 \\ x^2 + 2x + 1 \overline{) 3x^3 + x^2 + 2x + 5} \\ \underline{3x^3 + 6x^2 + 3x} \\ -5x^2 - x + 5 \\ \underline{-5x^2 - 10x - 5} \\ 9x + 10 \end{array}$$

$$\frac{3x^3}{x^2} = 3x$$

$$\frac{-5x^2}{x^2} = -5$$

$$\text{ଲମ୍ବ = } 3x - 5$$

$$\text{ଶେଷ} = 9x + 10$$

10)

$$a_3 = 600 = a + 2d \quad \text{--- (1)}$$

$$a_7 = 700 = a + 6d \quad \text{--- (2)}$$

$$(2) - (1) \text{ କରା}$$

$$\begin{array}{r} a + 6d = 700 \\ \underline{a + 2d = 600} \\ 4d = 100 \end{array}$$

$$\boxed{d = 25}$$

$$\begin{aligned} \therefore a &= 600 - 2d \\ &= 600 - 2(25) \end{aligned}$$

$$\boxed{\therefore a = 550}$$

a) ୨ୟମ ପର୍ଯ୍ୟନ୍ତ ଉପାଦାନ ୫୫୦ ଥିବ

b) 10ତମ ପର୍ଯ୍ୟନ୍ତ ଉପାଦାନ

$$\begin{aligned} a_{10} &= a + 9d \\ &= 550 + 9(25) \\ &= 550 + 225 \\ &= 775 \end{aligned}$$

$$\begin{aligned} c) S_7 &= \frac{n}{2} [2a + (n-1)d] \\ &= \frac{7}{2} [2(550) + 6 \times 25] \\ &= \frac{7}{2} [1100 + 150] = 4375 \end{aligned}$$

11) $(2, 3)$ $(-1, 0)$ $(2, -4)$ ત્રિકોણનું ક્ષેત્રફળ.

$$\begin{aligned}\Delta \text{નું ક્ષેત્રફળ} &= \frac{1}{2} \left| x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2) \right| \\ &= \frac{1}{2} \left| 2(0 - (-4)) + (-1)(-4 - 3) + 2(3 - 0) \right| \\ &= \frac{1}{2} \left| 2(4) - 1(-7) + 2(3) \right| \\ &= \frac{1}{2} \left| 8 + 7 + 6 \right| = \frac{1}{2} \left| 21 \right| \\ &= \frac{21}{2}\end{aligned}$$

12) ધારો કે ~~સે~~ દેશની ઝડપ x કિમી/કલાક
બસની ઝડપ y કિમી/કલાક

$$\text{ઝડપ} = \frac{\text{અંતર}}{\text{સમય}} \Rightarrow \text{સમય} = \frac{\text{અંતર}}{\text{ઝડપ}}$$

$$\frac{60}{x} + \frac{(300 - 60)}{y} = 4$$

$$\frac{60}{x} + \frac{240}{y} = 4 \quad \text{--- (1)}$$

$$\frac{100}{x} + \frac{(300-100)}{y} = 4 \text{ કલાક} + 10 \text{ મિનિટ}$$

$$\frac{100}{x} + \frac{200}{y} = 4 + \frac{10}{60} = \frac{240+10}{60} = \frac{250}{60} \quad (2)$$

~~સાધના~~ $\frac{1}{x} = a \quad \frac{1}{y} = b$ ધારતા

$$10 (60a + 240b = 4)$$

$$6 (100a + 200b = \frac{250}{60} = \frac{25}{6})$$

$$600a + 2400b = 40$$

$$600a + 1200b = 25$$

$$1200b = 15$$

$$b = \frac{15}{1200} = \frac{1}{80} \therefore y = \frac{1200}{15} = 80 \text{ કમ/કલાક}$$

$$60a + 240\left(\frac{15}{1200}\right) = 4$$

$$60a = 4 - \frac{240 \times 15}{1200} = 4 - 3 = 1$$

$$a = \frac{1}{60} = \frac{1}{x} \Rightarrow x = 60 \text{ કમ/કલાક}$$

$$x = \text{ફેરની ગતિ} = 60 \text{ કમ/કલાક}$$

$$y = \text{બંધની ગતિ} = 80 \text{ કમ/કલાક}$$