



## Exercise 6D

Q1

**Answer :**

(i) We have:

$$\begin{aligned} & (x+6)(x+6) \\ &= (x+6)^2 \\ &= x^2 + 6^2 + 2 \times x \times 6 \quad \left[ \text{using } (a+b)^2 = a^2 + b^2 + 2ab \right] \\ &= x^2 + 36 + 12x \end{aligned}$$

(ii) We have:

$$\begin{aligned} & (4x+5y)(4x+5y) \\ &= (4x+5y)^2 \\ &= (4x)^2 + (5y)^2 + 2 \times 4x \times 5y \quad \left[ \text{using } (a+b)^2 = a^2 + b^2 + 2ab \right] \\ &= 16x^2 + 25y^2 + 40xy \end{aligned}$$

(iii) We have:

$$\begin{aligned} & (7a+9b)(7a+9b) \\ &= (7a+9b)^2 \\ &= (7a)^2 + (9b)^2 + 2 \times 7a \times 9b \quad \left[ \text{using } (a+b)^2 = a^2 + b^2 + 2ab \right] \\ &= 49a^2 + 81b^2 + 126ab \end{aligned}$$

(iv) We have:

$$\begin{aligned} & \left(\frac{2}{3}x + \frac{4}{5}y\right)\left(\frac{2}{3}x + \frac{4}{5}y\right) \\ &= \left(\frac{2}{3}x + \frac{4}{5}y\right)^2 \\ &= \left(\frac{2}{3}x\right)^2 + \left(\frac{4}{5}y\right)^2 + 2 \times \frac{2}{3}x \times \frac{4}{5}y \quad \left[\text{using } (a+b)^2 = a^2 + b^2 + 2ab\right] \\ &= \frac{4}{9}x^2 + \frac{16}{25}y^2 + \frac{16}{15}xy \end{aligned}$$

(v) We have:

$$\begin{aligned} & (x^2 + 7)(x^2 + 7) \\ &= (x^2 + 7)^2 \\ &= (x^2)^2 + 7^2 + 2 \times x^2 \times 7 \quad \left[\text{using } (a+b)^2 = a^2 + b^2 + 2ab\right] \\ &= x^4 + 49 + 14x^2 \end{aligned}$$

(vi) We have:

$$\begin{aligned} & \left(\frac{5}{6}a^2 + 2\right)\left(\frac{5}{6}a^2 + 2\right) \\ &= \left(\frac{5}{6}a^2 + 2\right)^2 \\ &= \left(\frac{5}{6}a^2\right)^2 + (2)^2 + 2 \times \frac{5}{6}a^2 \times 2 \quad \left[\text{using } (a+b)^2 = a^2 + b^2 + 2ab\right] \\ &= \frac{25}{36}a^4 + 4 + \frac{10}{3}a^2 \end{aligned}$$

Q2

**Answer :**

(i) We have:

$$\begin{aligned} & (x - 4)(x - 4) \\ &= (x - 4)^2 \\ &= x^2 - 2 \times x \times 4 + 4^2 \quad \left[\text{using } (a-b)^2 = a^2 - 2ab + b^2\right] \\ &= x^2 - 8x + 16 \end{aligned}$$

(ii) We have:

$$\begin{aligned} & (2x - 3y)(2x - 3y) \\ &= (2x - 3y)^2 \\ &= (2x)^2 - 2 \times 2x \times 3y + (3y)^2 \quad \left[\text{using } (a-b)^2 = a^2 - 2ab + b^2\right] \\ &= 4x^2 - 12xy + 9y^2 \end{aligned}$$

(iii) We have:

$$\begin{aligned} & \left(\frac{3}{4}x - \frac{5}{6}y\right)\left(\frac{3}{4}x - \frac{5}{6}y\right) \\ &= \left(\frac{3}{4}x - \frac{5}{6}y\right)^2 \\ &= \left(\frac{3}{4}x\right)^2 - 2 \times \frac{3}{4}x \times \frac{5}{6}y + \left(\frac{5}{6}y\right)^2 \quad \left[\text{using } (a-b)^2 = a^2 - 2ab + b^2\right] \\ &= \frac{9}{16}x^2 - \frac{15}{12}xy + \frac{25}{36}y^2 \end{aligned}$$

(iv) We have:

$$\begin{aligned} & \left(x - \frac{3}{x}\right)\left(x - \frac{3}{x}\right) \\ &= \left(x - \frac{3}{x}\right)^2 \\ &= (x)^2 - 2 \times x \times \frac{3}{x} + \left(\frac{3}{x}\right)^2 \quad \left[\text{using } (a-b)^2 = a^2 - 2ab + b^2\right] \\ &= x^2 - 6 + \frac{9}{x^2} \end{aligned}$$

(v) We have:

$$\begin{aligned} & \left(\frac{1}{3}x^2 - 9\right)\left(\frac{1}{3}x^2 - 9\right) \\ &= \left(\frac{1}{3}x^2 - 9\right)^2 \\ &= \left(\frac{1}{3}x^2\right)^2 - 2 \times \frac{1}{3}x^2 \times 9 + (9)^2 \quad \left[\text{using } (a-b)^2 = a^2 - 2ab + b^2\right] \\ &= \frac{1}{9}x^4 - 6x^2 + 81 \end{aligned}$$

(vi) We have:

$$\begin{aligned} & \left(\frac{1}{2}y^2 - \frac{1}{3}y\right)\left(\frac{1}{2}y^2 - \frac{1}{3}y\right) \\ &= \left(\frac{1}{2}y^2 - \frac{1}{3}y\right)^2 \\ &= \left(\frac{1}{2}y^2\right)^2 - 2 \times \frac{1}{2}y^2 \times \frac{1}{3}y + \left(\frac{1}{3}y\right)^2 \quad \left[\text{using } (a-b)^2 = a^2 - 2ab + b^2\right] \\ &= \frac{1}{4}y^4 - \frac{1}{3}y^3 + \frac{1}{9}y^2 \end{aligned}$$

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