

Ans 1  $(103)^2 = (100+3)^2$

$$\begin{aligned}(100+3)^2 &= a^2 + 2ab + b^2 \\ &= 100^2 + 2(100 \times 3) + 3^2 \\ &= 10000 + 600 + 9 = 10609 \\ &= \cancel{10000} + \cancel{1200} + 9 \\ &= \cancel{101209}\end{aligned}$$

Ans 2  $16m^2 - 9n^2 = (a+b)(a-b)$

$$\begin{aligned}&= (16m^2 + 9n^2)(16m^2 - 9n^2) \\ &= \cancel{(16m \times 16m)} - \cancel{(9n \times 9n)} \\ &= 16m(16m - 9n) + 9n(16m - 9n) \\ &= 256m^2 + \cancel{144mn} + \cancel{144mn} - 81n^2 \\ &= 256m^2 - 81n^2\end{aligned}$$

Ans 3  $(3x+4y)^2 = a^2 + 2ab + b^2$

$$\begin{aligned}&= 3x^2 + 2(3x \times 4y) + 4y^2 \\ &= 9x^2 + 24xy + 16y^2\end{aligned}$$

$$\begin{aligned} \text{Ans 4 } \left(\frac{x}{2} - \frac{y}{3}\right)^2 &= \left(\frac{x}{2}\right)^2 - 2\left(\frac{x}{2} \times \frac{y}{3}\right) + \left(\frac{y}{3}\right)^2 \\ &= \frac{x^2}{4} - \frac{2xy}{6} + \frac{y^2}{9} \end{aligned}$$

$$\text{Ans 5 } \cancel{\left(a^2 - b^2\right)^2} \quad \cancel{\left(a^2b - b^2a\right)^2} = a^4b^2 - b^4a^2$$

$$\begin{aligned} \text{Ans 5 } \left(a^2b - b^2a\right)^2 &= \left(a^2b\right)^2 - 2\left(a^2b \times b^2a\right) + \left(b^2a\right)^2 \\ &= a^4b^2 - 2a^3b^3 + b^4a^2 \end{aligned}$$

$$\text{Ans 6 } \left(1.5x^2 - 0.3y^2\right)\left(1.5x^2 + 0.3y^2\right) \neq$$

$$= a^2 - b^2$$

$$= (1.5x)^2 - (0.3y)^2$$

$$= 3x^2 - 0.9y^2$$

$$\begin{aligned}\text{Ans 7 } (3x + 5y)^2 &= (3x)^2 + (5y)^2 + 2(3x \times 5y) \\ &= 9x^2 + 25y^2 + 2(15xy) \\ &= 181 + 2(-90) \\ &= 181 - 180 \\ &= 1\end{aligned}$$

$$\begin{aligned}\text{Ans 8 } 104 \times 96 &= (100 + 4)(100 - 4) \\ &= (100)^2 - (4)^2 \\ &= 10000 - 16 \\ &= 9984\end{aligned}$$

$$\begin{aligned}\text{Ans 9 } (997)^2 &= (1000 - 3)^2 \\ (1000 - 3)^2 &= 1000^2 - 2(1000 \times 3) + 3^2 \\ &= 1000000 - 6000 + 9 \\ &= 994000 + 9 \\ &= 994009\end{aligned}$$

Ans 10  $103 \times 107 = (100+3)(100+7)$

$$\begin{aligned}(100+3)(100+7) &= x^2 + x(a+b) + ab \\ &= 100^2 + 100(3+7) + (3 \times 7) \\ &= 10000 + ~~30~~ 2100 + 21 \\ &= 12121\end{aligned}$$