

5. સરાવાસાઠી અધિક પ્રશ્ન

1. સરલરૂપ દયા.

(i) $(2x + 7y)^3 + (2x - 7y)^3$

ઁકલ : $(2x + 7y)^3 + (2x - 7y)^3$

$$(a + b)^3 = a^3 + 3 a^2b + 3ab^2 + b^3 \text{ [સૂત્ર]}$$

$$(a - b)^3 = a^3 - 3 a^2b + 3ab^2 - b^3 \text{ [સૂત્ર]}$$

$$= (2x)^3 + 3 (2x)^2(7y) + 3 (2x) (7y)^2 + (7y)^3 +$$

$$(2x)^3 - 3 (2x)^2 (7y) + 3 (2x) (7y)^2 - (7y)^3$$

$$= 8x^3 + 21y \times 4x^2 + 6x \times 49y^2 + 343y^3 +$$

$$8x^3 - 21y \times 4x^2 + 6x \times 49y^2 - 343y^3$$

$$= 8x^3 + 84x^2 y + 294xy^2 + 343y^3 + 8x^3 - 84x^2 y$$

$$+ 294xy^2 - 343y^3$$

$$= 8x^3 + 8x^3 + 84x^2 y - 84x^2 y + 294xy^2 + 294xy^2$$

$$+ 343y^3 - 343y^3$$

$$= 16x^3 + 588xy^2$$

$$(ii) (5a + 6b)^3 - (5a - 6b)^3$$

$$\text{उकल : } (5a + 6b)^3 - (5a - 6b)^3$$

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 \dots\dots\dots [\text{सूत्र}]$$

$$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3 \dots\dots\dots [\text{सूत्र}]$$

$$= (5a)^3 + 3(5a)^2(6b) + 3(5a)(6b)^2 + (6b)^3 - \\ [(5a)^3 - 3(5a)^2(6b) + 3(5a)(6b)^2 - (6b)^3]$$

$$= 125a^3 - 18b \times 25a^2 + 15a \times 36b^2 + 216b^3 -$$

$$[125a^3 - 18b \times 25a^2 + 15a \times 36b^2 - 216b^3]$$

$$= \underline{125a^3} + \underline{450a^2b} + \underline{540ab^2} + 216b^3 - \underline{125a^3} +$$

$$\underline{450a^2b} - \underline{540ab^2} + 216b^3$$

$$= 125a^3 - 125a^3 + 450a^2b + 450a^2b + 540ab^2$$

$$- 540ab^2 + 216b^3 + 216b^3$$

$$= 900a^2b + 432b^3$$

$$(iii) \left(\frac{m}{4} + \frac{n}{3}\right)^3 + \left(\frac{m}{4} - \frac{n}{3}\right)^3$$

$$\text{उकल : } \left(\frac{m}{4} + \frac{n}{3}\right)^3 + \left(\frac{m}{4} - \frac{n}{3}\right)^3$$

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 \dots\dots\dots [\text{सूत्र}]$$

$$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3 \dots\dots\dots [\text{सूत्र}]$$

$$= \left(\frac{m}{4}\right)^3 + 3 \left(\frac{m}{4}\right)^2 \left(\frac{n}{3}\right) + 3 \left(\frac{m}{4}\right) \left(\frac{n}{3}\right)^2 + \left(\frac{n}{3}\right)^3$$

$$+ \left(\frac{m}{4}\right)^3 - 3 \left(\frac{m}{4}\right)^2 \left(\frac{n}{3}\right) + 3 \left(\frac{m}{4}\right) \left(\frac{n}{3}\right)^2 - \left(\frac{n}{3}\right)^3$$

$$= \frac{m^3}{64} + 3 \times \frac{m^2}{16} \times \frac{n}{3} + 3 \times \frac{m}{4} \times \frac{n^2}{9} + \frac{n^3}{27} + \frac{m^3}{64} -$$

$$3 \times \frac{m^2}{16} \times \frac{n}{3} + 3 \times \frac{m}{4} \times \frac{n^2}{9} - \frac{n^3}{27}$$

$$= \frac{m^3}{64} + \frac{m^2n}{16} + \frac{mn^2}{12} + \frac{n^3}{27} + \frac{m^3}{64} - \frac{m^2n}{16} + \frac{mn^2}{12} - \frac{n^3}{27}$$

$$= \frac{m^3}{64} + \frac{m^3}{64} + \frac{m^2n}{16} - \frac{m^2n}{16} + \frac{mn^2}{12} + \frac{mn^2}{12} + \frac{n^3}{27} - \frac{n^3}{27}$$

$$= \frac{2m^3}{64} + \frac{2mn^2}{12}$$

$$= \frac{m^3}{32} + \frac{mn^2}{6}$$

$$(iv) \left(3p + \frac{1}{3p}\right)^3 - \left(3p - \frac{1}{3p}\right)^3$$

$$\text{उकल : } \left(3p + \frac{1}{3p}\right)^3 - \left(3p - \frac{1}{3p}\right)^3$$

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 \dots\dots\dots [\text{सूत्र}]$$

$$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3 \dots\dots\dots [\text{सूत्र}]$$

$$\begin{aligned} &= (3p)^3 + 3(3p)^2 \left(\frac{1}{3p}\right) + 3(3p) \left(\frac{1}{3p}\right)^2 + \left(\frac{1}{3p}\right)^3 \\ &- \left[(3p)^3 - 3(3p)^2 \left(\frac{1}{3p}\right) + 3(3p) \left(\frac{1}{3p}\right)^2 - \left(\frac{1}{3p}\right)^3 \right] \end{aligned}$$

$$= 27p^3 + 3 \times 9p^2 \times \frac{1}{3p} + 9p \times \frac{1}{9p^2} + \frac{1}{27p^3}$$

$$- 27p^3 + 3 \times 9p^2 \times \frac{1}{3p} - 9p \times \frac{1}{9p^2} + \frac{1}{27p^3}$$

$$= 27p^3 + 9p + \frac{1}{p} + \frac{1}{27p^3} - 27p^3 + 9p - \frac{1}{p} + \frac{1}{27p^3}$$

$$= 27p^3 - 27p^3 + 9p + 9p + \frac{1}{p} - \frac{1}{p} + \frac{1}{27p^3} + \frac{1}{27p^3}$$

$$= 18p + \frac{2}{27p^3}$$

2. सूत्रांचा वापर करून सोपे रूप द्या.

$$(i) (2a + 4b + 6)^2 + (2a - 4b + 6)^2$$

$$\text{उकल : } (2a + 4b + 6)^2 + (2a - 4b + 6)^2$$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac \dots[\text{सूत्र}]$$

$$= [(2a)^2 + (4b)^2 + (6)^2 + 2 \times (2a) \times (4b) + 2 \times 4b \times 6 + 2 \times 2a \times 6] + [(2a)^2 + (-4b)^2 + (6)^2 + 2(2a)(-4b) + 2(-4b)(6) + 2(2a)(6)]$$

$$= 4a^2 + 16b^2 + 36 + 16ab + 48b + 24a + 4a^2 + 16b^2 + 36 - 16ab - 48b + 24a$$

$$= 4a^2 + 4a^2 + 16b^2 + 16b^2 + 36 + 36 + 16ab - 16ab + 48b - 48b + 24a + 24a$$

$$= 8a^2 + 32b^2 + 72 + 48a$$

$$(ii) (6x - 5y - 4)^2 - (6x + 5y - 4)^2$$

$$\text{उकल : } (6x - 5y - 4)^2 - (6x + 5y - 4)^2$$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac \dots[\text{सूत्र}]$$

$$\begin{aligned}
&= [(6x)^2 + (-5y)^2 + (-4)^2 + 2(6x)(-5y) + \\
&\quad 2(-5y)(-4) + 2(6x)(-4)] - [(6x)^2 + (5y)^2 + \\
&\quad (4)^2 + 2(6x)(5y) + 2(5y)(-4) + 2(6x)(-4)] \\
&= [36x^2 + 25y^2 + 16 - 60xy + 40y - 48x] - \\
&\quad [36x^2 + 25y^2 + 16 + 60xy - 40y - 48x] \\
&= \underline{36x^2 - 36x^2} + \underline{25y^2 - 25y^2} + \underline{16 - 16} - \\
&\quad \underline{60xy - 60xy} + \underline{40y + 40y} - 48x + 48x \\
&= -120xy + 80y
\end{aligned}$$

$$(iii) (5x - 4y + 3z)^2 - (5x + 4y - 3z)^2$$

$$\text{उकल : } (5x - 4y + 3z)^2 - (5x + 4y - 3z)^2$$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac \dots [\text{सूत्र}]$$

$$\begin{aligned}
&= [(5x)^2 + (-4y)^2 + (3z)^2 + 2(5x)(-4y) + \\
&\quad 2(-4y)(3z) + 2(5x)(3z)] - [(5x)^2 + (4y)^2 + \\
&\quad (-3z)^2 + 2(5x)(4y) + 2(4y)(-3z) + \\
&\quad 2(5x)(-3z)]
\end{aligned}$$

$$= 25x^2 + 16y^2 + 9z^2 - 40xy - 24yz + 30xz$$

$$- [25x^2 + 16y^2 + 9z^2 + 40xy - 24yz - 30xz]$$

$$= 25x^2 - 25x^2 + 16y^2 - 16y^2 + 9z^2 - 9z^2 - 40xy - 40xy - 24yz + 24yz + 30xz + 30xz$$

$$= - 80xy + 30xz$$

$$\text{(iv)} \left(\frac{1}{p} + \frac{1}{2q} + 3 \right)^2 - \left(\frac{1}{p} + \frac{1}{2q} - 3 \right)^2$$

$$\text{उकल : } \left(\frac{1}{p} + \frac{1}{2q} + 3 \right)^2 - \left(\frac{1}{p} + \frac{1}{2q} - 3 \right)^2$$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac \dots [\text{सूत्र}]$$

$$\begin{aligned} &= \left[\left(\frac{1}{p} \right)^2 + \left(\frac{1}{2q} \right)^2 + (3)^2 + 2 \times \left(\frac{1}{p} \right) \left(\frac{1}{2q} \right) + 2 \times \right. \\ &\quad \left. \left(\frac{1}{2q} \right) \times 3 + 2 \times \left(\frac{1}{p} \right) \times 3 \right] - \left[\left(\frac{1}{p} \right)^2 + \left(\frac{1}{2q} \right)^2 + \right. \\ &\quad \left. (-3)^2 + 2 \times \left(\frac{1}{p} \right) \left(\frac{1}{2q} \right) + 2 \times \left(\frac{1}{2q} \right) \times (-3) + \right. \\ &\quad \left. 2 \left(\frac{1}{p} \right) (-3) \right] \end{aligned}$$

$$= \left[\frac{1}{p^2} + \frac{1}{4q^2} + 9 + \frac{1}{pq} + \frac{3}{q} + \frac{6}{p} \right]$$

$$\begin{aligned}
& - \left[\frac{1}{p^2} + \frac{1}{4q^2} + 9 + \frac{1}{pq} - \frac{3}{q} - \frac{6}{p} \right] \\
& = \frac{1}{p^2} - \frac{1}{p^2} + \frac{1}{4q^2} - \frac{1}{4q^2} + 9 - 9 + \frac{1}{pq} - \frac{1}{pq} + \frac{3}{q} + \frac{3}{q} + \\
& \quad \frac{6}{p} + \frac{6}{p} \\
& = \frac{6}{q} + \frac{12}{p}
\end{aligned}$$

3. विस्तार करा.

(i) $(x - 2y - 3z)^2$

उकल : $(x - 2y - 3z)^2$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac \dots [\text{सूत्र}]$$

$$\begin{aligned}
& = (x)^2 + (-2y)^2 + (-3z)^2 + 2(x)(-2y) + \\
& \quad 2(-2y)(-3z) + 2(x)(-3z)
\end{aligned}$$

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

(ii) $(3a - 7b + 5c)^2$

उकल : $(3a - 7b + 5c)^2$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac \dots [\text{सूत्र}]$$

$$\begin{aligned}
 &= (3a)^2 + (-7b)^2 + (5c)^2 + 2(3a)(-7b) + \\
 &\quad 2(-7b)(5c) + 2(3a)(5c) \\
 &= 9a^2 + 49b^2 + 25c^2 - 42ab - 70bc + 30ac
 \end{aligned}$$

(iii) $(6m + 5n - 4s)^2$

उकल : $(6m + 5n - 4s)^2$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac \dots[\text{सूत्र}]$$

$$\begin{aligned}
 &= (6m)^2 + (5n)^2 + (-4s)^2 + 2(6m)(5n) \\
 &\quad + 2(5n)(-4s) + 2(6m)(-4s) \\
 &= 36m^2 + 25n^2 + 16s^2 + 60mn - 40ns - 48ms
 \end{aligned}$$

(iv) $(3p + 4q + 5)^2$

उकल : $(3p + 4q + 5)^2$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac \dots[\text{सूत्र}]$$

$$\begin{aligned}
 &= (3p)^2 + (4q)^2 + (5)^2 + 2(3p)(4q) + 2(4q)(5) + \\
 &\quad 2(3p)(5) \\
 &= 9p^2 + 16q^2 + 25 + 24pq + 40q + 30p
 \end{aligned}$$

$$(v) (2m - 3n - 6p)^2$$

$$\text{उकल : } (2m - 3n - 6p)^2$$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac \dots [\text{सूत्र}]$$

$$= (2m)^2 + (-3n)^2 + (-6p)^2 + 2(2m)(-3n) + 2(-3n)(-6p) + 2(2m)(-6p)$$

$$= 4m^2 + 9n^2 + 36p^2 - 12mn + 36np - 24mp$$

$$(vi) (7p - 5q + 6r)^2$$

$$\text{उकल : } (7p - 5q + 6r)^2$$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac \dots [\text{सूत्र}]$$

$$= (7p)^2 + (5q)^2 + (6r)^2 + 2(7p)(-5q) + 2(-5q)(6r) + 2(7p)(6r)$$

$$= 49p^2 + 25q^2 + 36r^2 - 70pq - 60qr + 84pr$$

4. सूत्रांचा वापर करून विस्तार करा.

$$(i) (m + 5)^3$$

$$\text{उकल : } (m + 5)^3$$

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 \dots [\text{सूत्र}]$$

$$= m^3 + [3 \times (m)^2 \times 5] + [3 \times m \times (5)^2] + (5)^3$$

$$= m^3 + 15m^2 + 3m \times 25 + 125$$

$$= m^3 + 15m^2 + 75m + 125$$

(ii) $(32)^3$

उकल : $(32)^3$

$$= (30 + 2)^3$$

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 \dots \text{[सूत्र]}$$

$$= (30)^3 + [3 \times (30)^2 \times 2] + [3 \times 30 \times (2)^2] + (2)^3$$

$$= 27000 + [6 \times 900] + [90 \times 4] + 8$$

$$= 27000 + 5400 + 360 + 8$$

$$= 32768$$

(iii) $\left(x + \frac{1}{2}\right)^3$

उकल : $\left(x + \frac{1}{2}\right)^3$

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 \dots \text{[सूत्र]}$$

$$\begin{aligned}
 &= (x)^3 + \left[3 \times x^2 \times \frac{1}{2} \right] + \left[3 \times x \times \left(\frac{1}{2} \right)^2 \right] + \left(\frac{1}{2} \right)^3 \\
 &= x^3 + \frac{3x^2}{2} + \frac{3x}{4} + \frac{1}{8}
 \end{aligned}$$

$$\text{(iv)} \quad \left(\frac{4x}{3} + \frac{3}{2x} \right)^3$$

$$\text{उकल : } \left(\frac{4x}{3} + \frac{3}{2x} \right)^3$$

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 \dots [\text{सूत्र}]$$

$$\begin{aligned}
 &= \left(\frac{4x}{3} \right)^3 + \left[3 \times \left(\frac{4x}{3} \right)^2 \left(\frac{3}{2x} \right) \right] + \left[3 \times \left(\frac{4x}{3} \right) \left(\frac{3}{2x} \right)^2 \right] + \\
 &\quad \left(\frac{3}{2x} \right)^3
 \end{aligned}$$

$$= \frac{64x^3}{27} + \left[3 \times \frac{16x^2}{9} \times \frac{3}{2x} \right] + \left[3 \times \frac{4x}{3} \times \frac{9}{4x^2} \right] + \frac{27}{8x^3}$$

$$= \frac{64x^3}{27} + \frac{16x^2}{2x} + \frac{9}{x} + \frac{27}{8x^3}$$

$$= \frac{64x^3}{27} + 8x + \frac{9}{x} + \frac{27}{8x^3}$$

$$(v) (13 - x)^3$$

$$\text{उकल : } (13 - x)^3$$

$$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3.... [\text{सूत्र}]$$

$$= (13)^3 - [3 \times (13)^2 \times x] + [3 \times (13) \times x^2] - (x)^3$$

$$= 2197 - [3x \times 169] + 39x^2 - x^3$$

$$= 2197 - 507x + 39x^2 - x^3$$

$$(vi) (78)^3$$

$$\text{उकल : } (78)^3$$

$$= (80 - 2)^3$$

$$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3.... [\text{सूत्र}]$$

$$= (80)^3 - [3 \times (80)^2 \times (2)] + [3 \times 80 \times (2)^2] - (2)^3$$

$$= 512000 - [6 \times 6400] + [240 \times 4] - 8$$

$$= 512000 - 38400 + 960 - 8$$

$$= [512000 + 960] - [38400 + 8]$$

$$= 512960 - 38408$$

$$= 474,552$$

$$\text{(vii)} \quad \left(5x - \frac{1}{5x}\right)^3$$

$$\text{उकल : } \left(5x - \frac{1}{5x}\right)^3$$

$$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3 \dots [\text{सूत्र}]$$

$$= (5x)^3 - \left[3 \times (5x)^2 \times \frac{1}{5x}\right] + \left[3 \times 5x \times \left(\frac{1}{5x}\right)^2\right] - \left(\frac{1}{5x}\right)^3$$

$$= 125x^3 - \left[3 \times 25x^2 \times \frac{1}{5x}\right] + \left[3 \times 5x \times \frac{1}{25x^2}\right] - \frac{1}{125x^3}$$

$$= 125x^3 - 15x + \frac{3}{5x} - \frac{1}{125x^3}$$

$$\text{(viii)} \quad \left(\frac{3p}{5q} - \frac{5q}{3p}\right)^3$$

$$\text{उकल : } \left(\frac{3p}{5q} - \frac{5q}{3p}\right)^3$$

$$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3 \dots [\text{सूत्र}]$$

$$= \left(\frac{3p}{5q}\right)^3 - \left[3 \times \left(\frac{3p}{5q}\right)^2 \times \left(\frac{5q}{3p}\right)\right] + \left[3 \times \left(\frac{3p}{5q}\right) \times \left(\frac{5q}{3p}\right)^2\right]$$

$$- \left(\frac{5q}{3p}\right)^3$$

$$= \frac{27p^3}{125q^3} - \left[3 \times \frac{9p^2}{25q^2} \times \frac{5q}{3p}\right] + \left[3 \times \frac{3p}{5q} \times \frac{25q^2}{9p^2}\right] - \frac{125q^3}{27p^3}$$

$$= \frac{27p^3}{125q^3} - \frac{9p}{5q} + \frac{5q}{p} - \frac{125q^3}{27p^3}$$

5. विस्तार करा.

(i) $(q + 5)(q - 4)$

उकल : $(q + 5)(q - 4)$

$$= q^2 + (5 - 4)q + (5) \times (-4)$$

$$= q^2 + q - 20$$

(ii) $(3x + 6y)(3x - 4y)$

उकल : $(3x + 6y)(3x - 4y)$

$$(x + a)(x + b) = x^2 + (a + b)x + ab \dots [\text{सूत्र}]$$

$$= (3x)^2 + [(6y) + (-4y)] 3x + [(6y) \times (-4y)]$$

$$= 9x^2 + 2y \times 3x - 24y^2$$

$$= 9x^2 + 6xy - 24y^2$$

(iii) $(5a + 7b)(5a + 9b)$

उकल : $(5a + 7b)(5a + 9b)$

$$(x + a)(x + b) = x^2 + (a + b)x + ab \dots [\text{सूत्र}]$$

$$= (5a)^2 + [7b + 9b] 5a + [(7b) \times (9b)]$$

$$= 25a^2 + 16b \times 5a + 63b^2$$

$$= 25a^2 + 80ab + 63b^2$$

$$\text{(iv) } (p - 5) (p - 7)$$

$$\text{उकल : } (p - 5) (p - 7)$$

$$(x + a)(x + b) = x^2 + (a + b)x + ab \dots [\text{सूत्र}]$$

$$= p^2 + [-5 - 7] p + [(-5) \times (-7)]$$

$$= p^2 - 12p + 35$$

$$\text{(v) } \left(a + \frac{1}{3}\right) \left(a - \frac{2}{3}\right)$$

$$\text{उकल : } \left(a + \frac{1}{3}\right) \left(a - \frac{2}{3}\right)$$

$$(x + a)(x + b) = x^2 + (a + b)x + ab \dots [\text{सूत्र}]$$

$$= a^2 + \left[\frac{1}{3} + \left(-\frac{2}{3}\right)\right] a + \left[\left(\frac{1}{3}\right) \times \left(-\frac{2}{3}\right)\right]$$

$$= a^2 + \left[\frac{1}{3} - \frac{2}{3}\right] a - \frac{2}{9}$$

$$= a^2 - \frac{1}{3} a - \frac{2}{9}$$

$$(vi) (11 + x)(11 - x)$$

$$\text{उकल : } (11 + x)(11 - x)$$

$$(x + a)(x + b) = x^2 + (a + b)x + ab \dots [\text{सूत्र}]$$

$$= (11)^2 + [x + (-x)] 11 + [x \times (-x)]$$

$$= 121 + [x - x] 11 - x^2$$

$$= 121 + 0 - x^2$$

$$= 121 - x^2$$

6. खालील कृती पूर्ण करा.

$$\left(m + \frac{1}{m}\right) \left(m + \frac{1}{m}\right)$$

$$= m^2 + [\square + \square] m + \square \times \square$$

$$= m^2 + \square m + \square$$

$$= m^2 + \square + \square$$

$$\text{उकल : } \left(m + \frac{1}{m}\right) \left(m + \frac{1}{m}\right)$$

$$= m^2 + \left[\frac{1}{m} + \frac{1}{m}\right] m + \frac{1}{m} \times \frac{1}{m}$$

$$= m^2 + \boxed{\frac{2}{m}} m + \boxed{\frac{1}{m^2}}$$

$$= m^2 + \boxed{2} + \boxed{\frac{1}{m^2}}$$

7. खालील कृती पूर्ण करा.

$$(2p + 3q)^3$$

$$= \boxed{}^3 + [3 \times \boxed{} \times \boxed{}] + [3 \times \boxed{} \times \boxed{}] + (3q)^3$$

$$= \boxed{} + [\boxed{} \times \boxed{}] + [\boxed{} \times \boxed{}] + 27q^3$$

$$= \boxed{} + \boxed{} + \boxed{} + 27q^3$$

$$\text{उकल : } (2p + 3q)^3$$

$$= \boxed{(2p)}^3 + [3 \times \boxed{(2p)^2} \times \boxed{3q}] + [3 \times \boxed{2p} \times \boxed{(3q)^2} + \boxed{(3q)^3}]$$

$$= \boxed{8p^3} + [\boxed{9q} \times \boxed{4p^2}] + [\boxed{6p} \times \boxed{9q^2}] + 27q^3$$

$$= \boxed{8p^3} + \boxed{36p^2q} + \boxed{54pq^2} + 27q^3$$

8. खालील कृती पूर्ण करा.

$$\begin{aligned}
 & (6x + 7y + 8z)^2 \\
 &= (6x)^2 + (7y)^2 + \square + 2 \times 6x \times 7y + 2 \times \square \times 8z + 2 \times \\
 & \quad \square \times \square \\
 &= \square + 49y^2 + \square + 84xy + \square + \square
 \end{aligned}$$

उकल : $(6x + 7y + 8z)^2$

$$\begin{aligned}
 &= (6x)^2 + (7y)^2 + \boxed{(8z)^2} + 2 \times 6x \times 7y + 2 \times \boxed{7y} \times \\
 & \quad 8z + 2 \times \boxed{6x} \times \boxed{8z} \\
 &= \boxed{36x^2} + 49y^2 + \boxed{64z^2} + 84xy + \boxed{112yz} + \boxed{96xz}
 \end{aligned}$$

9. खालील विस्तार चूक की बरोबर ते लिहा.

$$(1) (x^2 + 3)(x^2 - 2) = x^4 + x^2 - 6$$

उत्तर : बरोबर

स्पष्टीकरण : $(x^2 + 3)(x^2 - 2)$

$$\begin{aligned}
 &= (x^2)(x^2) + (3 - 2) \times x^2 + (3) \times (-2) \\
 &= x^4 + x^2 - 6
 \end{aligned}$$

$$(2) (x + 6)^3 = x^3 + 18x + 108x^2 + 216$$

उत्तर : चूक

स्पष्टीकरण : $(x + 6)^3$

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 \dots \dots \text{(सूत्र)}$$

$$= x^3 + 3(x)^2 6 + 3(x)(6)^2 + (6)^3$$

$$= x^3 + 18x^2 + 3x \times 36 + 216$$

$$= x^3 + 18x^2 + 108x + 216$$

$$(3) (4am - 3bn)^3 = 64a^3m^3 - 144ab^2m^2n - 108a^2bm^2n - 27b^3n^3$$

उत्तर : चूक

स्पष्टीकरण : $(4am - 3bn)^3$

$$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3 \dots \dots \text{(सूत्र)}$$

$$= (4am)^3 - 3 \times (4am)^2 \times (3bn) + 3(4am) \times (3bn)^2 - (3bn)^3$$

$$\begin{aligned}
&= 64a^3 m^3 - 3 \times 16a^2 m^2 \times 3bn + 12am \times \\
&\quad 9b^2 n^2 - 27b^3 n^3 \\
&= 64a^3 m^3 - 144a^2 b m^2 n + 108ab^2 mn^2 - \\
&\quad 27b^3 n^3
\end{aligned}$$

$$(4) (x^2 + y^2)^3 = x^6 + 3x^4 y^2 + 3x^2 y^4 + y^6$$

उत्तर : बरोबर

स्पष्टीकरण : $(x^2 + y^2)^3$

$$\begin{aligned}
(a + b)^3 &= a^3 + 3a^2 b + 3ab^2 + b^3 \dots \dots \text{(सूत्र)} \\
&= (x^2)^3 + 3(x^2)^2 (y^2) + 3(x^2)(y^2)^2 + (y^2)^3 \\
&= x^6 + 3x^4 y^2 + 3x^2 y^4 + y^6
\end{aligned}$$

$$(5) (2x + 3y)(2x + 5y) = 4x^2 + 16xy + 15y^2$$

उत्तर : बरोबर

स्पष्टीकरण : $(2x + 3y)(2x + 5y)$

$$\begin{aligned}
(x + a)(x + b) &= x^2 + (a + b)x + ab \dots \dots \text{(सूत्र)} \\
&= (2x)^2 + (3y + 5y) \times 2x + (3y) \times (5y)
\end{aligned}$$

$$= 4x^2 + 8y \times 2x + 15y^2$$

$$= 4x^2 + 16xy + 15y^2$$

10. खालील जोड्या जुळवा.

(1) ‘अ’ गट

‘ब’ गट

(i) $(a + b)^3$

(a) $(a + b + c)^2$

(ii) $x^2 + (a + b)x + ab$

(b) $a^3 + b^3 + 3ab(a + b)$

(iii) $(a - b)^3$

(c) $(x + a)(x + b)$

(iv) $a^2 + b^2 + c^2 +$

(d) $a^3 - b^3 - 3ab(a - b)$

$2ab + 2bc + 2ac$

उत्तर :

(i) $(a + b)^3 =$ (b) $a^3 + b^3 + 3ab(a + b)$

(ii) $x^2 + (a + b)x + ab =$ (c) $(x + a)(x + b)$

(iii) $(a - b)^3 =$ (d) $a^3 - b^3 - 3ab(a - b)$

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

(2) 'अ' गट

'ब' गट

(i) $(7m + 4p)(7m - 4p)$

(a) $9x^2 - 12xy + 4y^2$

(ii) $(3x - 2y)^2$

(b) $x^2 + 10xy + 25y^2$

(iii) $(x + 5y)^2$

(c) $x^3 + 6x^2 + 12x + 8$

(iv) $(x + 2)^3$

(d) $49m^2 - 16p^2$

उत्तर :

(i) $(7m + 4p)(7m - 4p) = (d) 49m^2 - 16p^2$

(ii) $(3x - 2y)^2 = (a) 9x^2 - 12xy + 4y^2$

(iii) $(x + 5y)^2 = (b) x^2 + 10xy + 25y^2$

(iv) $(x + 2)^3 = (c) x^3 + 6x^2 + 12x + 8$
