

## Practice Set 5.1 8th Std Maths Answers Chapter 5 Expansion Formulae

Question 1.

Expand :

i.  $(a + 2)(a - 1)$

ii.  $(m - 4)(m + 6)$

iii.  $(p + 8)(p - 3)$

iv.  $(13 + x)(13 - x)$

v.  $(3x + 4y)(3x + 5y)$

vi.  $(9x - 5t)(9x + 3t)$

vii.  $(m+23)(m-73)$

viii.  $(x+1x)(x-1x)$

ix.  $(1y+4)(1y-9)$

Solution:

i.  $(a + 2)(a - 1)$

$$= a^2 + (2 - 1)a + 2 \times (-1)$$

$$\dots [ \cdot \cdot (x + a)(x + b) = x^2 + (a + b)x + ab ]$$

$$= a^2 + a - 2$$

ii.  $(m - 4)(m + 6)$

$$= m^2 + (-4 + 6)m + (-4) \times 6$$

$$\dots [ \cdot \cdot (x + a)(x + b) = x^2 + (a + b)x + ab ]$$

$$= m^2 + 2m - 24$$

iii.  $(p + 8)(p - 3)$

$$= p^2 + (8 - 3)p + 8 \times (-3)$$

$$\dots [ \cdot \cdot (x + a)(x + b) = x^2 + (a + b)x + ab ]$$

$$= p^2 + 5p - 24$$

iv.  $(13 + x)(13 - x)$

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

$$\dots [ \cdot \cdot (x + a)(x + b) = x^2 + (a + b)x + ab ]$$

$$= 169 + 0 \times 13 - x^2$$

$$= 169 - x^2$$

v.  $(3x + 4y)(3x + 5y)$

$$= (3x)^2 + (4y + 5y)3x + 4y \times 5y$$

$$\dots [ \cdot \cdot (x + a)(x + b) = x^2 + (a + b)x + ab ]$$

$$= 9x^2 + 9y \times 3x + 20y^2$$

$$= 9x^2 + 27xy + 20y^2$$

vi.  $(9x - 5t)(9x + 3t)$

$$= (9x)^2 + [(-5t) + 3t]9x + (-5t) \times 3t$$

$$\dots [ \cdot \cdot (x + a)(x + b) = x^2 + (a + b)x + ab ]$$

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$$\begin{aligned} &= 81x^2 + (-2t) \times 9x - 15t^2 \\ &= 81x^2 - 18xt - 15t^2 \end{aligned}$$

vii.  $(m+23)(m-73)$

$$\begin{aligned} &= m^2 + \left(\frac{2}{3} - \frac{7}{3}\right)m + \frac{2}{3} \times \left(-\frac{7}{3}\right) \\ &\quad \dots [\because (x+a)(x+b) = x^2 + (a+b)x + ab] \\ &= m^2 - \frac{5}{3}m - \frac{14}{9} \end{aligned}$$

viii.  $(x+1x)(x-1x)$

$$\begin{aligned} &= x^2 + \left(\frac{1}{x} - \frac{1}{x}\right)x + \frac{1}{x} \times \left(-\frac{1}{x}\right) \\ &\quad \dots [\because (x+a)(x+b) = x^2 + (a+b)x + ab] \\ &= x^2 + 0 \times x - \frac{1}{x^2} \\ &= x^2 - \frac{1}{x^2} \end{aligned}$$

ix.  $(1y+4)(1y-9)$

$$\begin{aligned} &= \left(\frac{1}{y}\right)^2 + (4-9)\frac{1}{y} + 4 \times (-9) \\ &\quad \dots [\because (x+a)(x+b) = x^2 + (a+b)x + ab] \\ &= \frac{1}{y^2} - \frac{5}{y} - 36 \end{aligned}$$

### Maharashtra Board Class 8 Maths Chapter 5 Expansion Formulae Practice Set 5.1 Intext Questions and Activities

Question 1.

Use the above formulae to fill proper terms in the following boxes. (Textbook pg. no. 23)

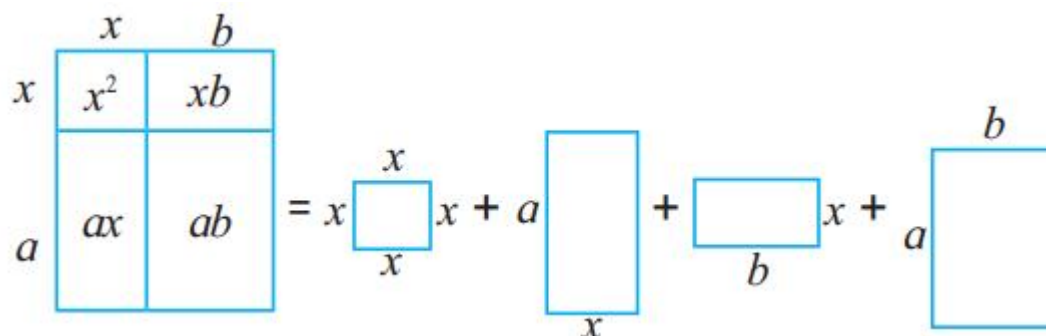
1.  $(x + 2y)^2 = x^2 + \underline{\hspace{1cm}} + 4y^2$
2.  $(2x - 5y)^2 = \underline{\hspace{1cm}} - 20xy + \underline{\hspace{1cm}}$
3.  $(101)^2 = (100 + 1)^2 = \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + 1^2 = \underline{\hspace{1cm}}$
4.  $(98)^2 = (100 - 2)^2 = 10000 - \underline{\hspace{1cm}} + \underline{\hspace{1cm}} = \underline{\hspace{1cm}}$
5.  $(5m + 3n)(5m - 3n) = \underline{\hspace{1cm}} - \underline{\hspace{1cm}} = \underline{\hspace{1cm}} - \underline{\hspace{1cm}}$

Solution:

1.  $(x + 2y)^2 = x^2 + 4xy + 4y^2$
2.  $(2x - 5y)^2 = 4x^2 - 20xy + 25y^2$
3.  $(101)^2 = (100 + 1)^2 = 10000 + 200 + 1^2 = 10201$
4.  $(98)^2 = (100 - 2)^2 = 10000 - 400 + 4 = 9604$
5.  $(5m + 3n)(5m - 3n) = (5m)^2 - (3n)^2 = 25m^2 - 9n^2$

Question 2.

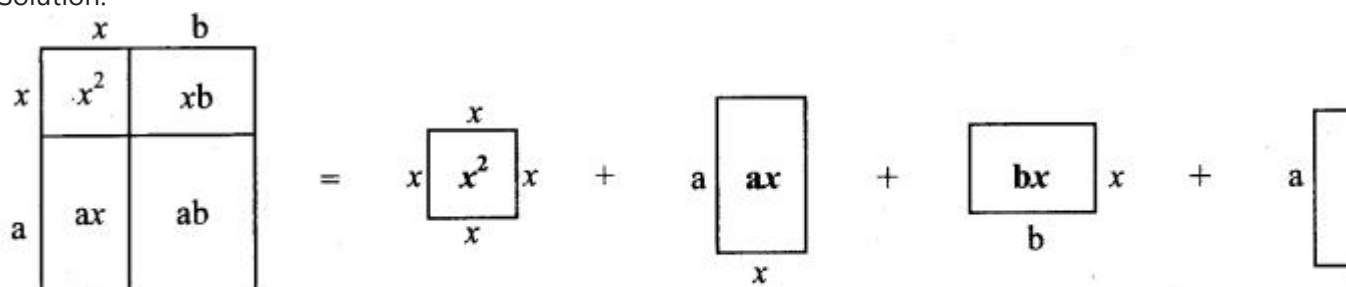
Expand  $(x + a)(x + b)$  using formulae for areas of a square and a rectangle. (Textbook pg. no. 23)



$$(x + a)(x + b) = x^2 + ax + bx + ab$$

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

Solution:



Area of rectangle  
is  $(x + a)(x + b)$

= Area of  
square is  $x^2$

+ Area of  
rectangle is  $ax$

+ Area of  
rectangle is  $bx$

+ Area of  
rectangle is  $ab$

$$\therefore (x + a)(x + b) = x^2 + ax + bx + ab$$

$$\therefore (x + a)(x + b) = x^2 + (a + b)x + ab$$

## Practice Set 5.2 8th Std Maths Answers Chapter 5 Expansion Formulae

Question 1.

Expand:

i.  $(k + 4)^3$

ii.  $(7x + 8y)^3$

iii.  $(7x + m)^3$

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iv.  $(52)^3$

v.  $(101)^3$

vi.  $(x+1x)^3$

vii.  $(2m+15)^3$

viii.  $(5xy+y5x)^3$

Solution:

i. Here,  $a = k$  and  $b = 4$

$$(k + 4)^3 = (k)^3 + 3(k)^2(4) + 3(k)(4)^2 + (4)^3$$

$$\dots [ \because (a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 ]$$

$$= k^3 + 12k^2 + 3(k)(16) + 64$$

$$= k^3 + 12k^2 + 48k + 64$$

ii. Here,  $a = 7x$  and  $b = 8y$

$$(7x + 8y)^3$$

$$= (7x)^3 + 3(7x)^2(8y) + 3(7x)(8y)^2 + (8y)^3$$

$$\dots [ \because (a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 ]$$

$$= 343x^3 + 3(49x^2)(8y) + 3(7x)(64y^2) + 512y^3$$

$$= 343x^3 + 1176x^2y + 1344xy^2 + 512y^3$$

iii. Here,  $a = 7$  and  $b = m$

$$(7 + m)^3 = (7)^3 + 3(7)^2(m) + 3(7)(m)^2 + (m)^3$$

$$\dots [ \because (a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 ]$$

$$= 343 + 3(49)(m) + 3(7)(m^2) + m^3$$

$$= 343 + 147m + 21m^2 + m^3$$

iv.  $(52)^3 = (50 + 3)^3$

Here,  $a = 50$  and  $b = 2$

$$(52)^3 = (50)^3 + 3(50)^2(2) + 3(50)(2)^2 + (2)^3$$

$$\dots [ \because (a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 ]$$

$$= 125000 + 3(2500)(2) + 3(50)(4) + 8$$

$$= 125000 + 15000 + 600 + 8$$

$$= 140608$$

v.  $(101)^3 = (100 + 1)^3$

Here,  $a = 100$  and  $b = 1$

$$(101)^3$$

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

$$\dots [ \because (a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3 ]$$

$$= 1000000 + 3(10000) + 3(100)(1) + 1$$

$$= 1000000 + 30000 + 300 + 1$$

$$= 1030301$$

vi. Here,  $a = x$  and  $b = \frac{1}{x}$

$$\begin{aligned} & \left(x + \frac{1}{x}\right)^3 \\ &= (x)^3 + 3(x)^2\left(\frac{1}{x}\right) + 3(x)\left(\frac{1}{x}\right)^2 + \left(\frac{1}{x}\right)^3 \\ & \dots [\because (a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3] \\ &= x^3 + 3x + 3x\left(\frac{1}{x^2}\right) + \frac{1}{x^3} \\ &= x^3 + 3x + \frac{3}{x} + \frac{1}{x^3} \end{aligned}$$

vii. Here,  $a = 2m$  and  $b = \frac{1}{5}$

$$\begin{aligned} & \left(2m + \frac{1}{5}\right)^3 \\ &= (2m)^3 + 3(2m)^2\left(\frac{1}{5}\right) + 3(2m)\left(\frac{1}{5}\right)^2 + \left(\frac{1}{5}\right)^3 \\ & \dots [\because (a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3] \\ &= 8m^3 + 3(4m^2)\left(\frac{1}{5}\right) + 3(2m)\left(\frac{1}{25}\right) + \frac{1}{125} \\ &= 8m^3 + \frac{12m^2}{5} + \frac{6m}{25} + \frac{1}{125} \end{aligned}$$

viii. Here,  $a = 5xy$  and  $b = y5x$

$$\begin{aligned} & \left( \frac{5x}{y} + \frac{y}{5x} \right)^3 \\ &= \left( \frac{5x}{y} \right)^3 + 3 \left( \frac{5x}{y} \right)^2 \left( \frac{y}{5x} \right) + 3 \left( \frac{5x}{y} \right) \left( \frac{y}{5x} \right)^2 + \left( \frac{y}{5x} \right)^3 \\ & \quad \dots [\because (a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3] \\ &= \frac{125x^3}{y^3} + 3 \left( \frac{5x}{y} \right) \left( \frac{5x}{y} \right) \left( \frac{y}{5x} \right) + 3 \left( \frac{5x}{y} \right) \left( \frac{y}{5x} \right) \left( \frac{y}{5x} \right) \\ & \quad + \frac{y^3}{125x^3} \\ &= \frac{125x^3}{y^3} + 3 \left( \frac{5x}{y} \right) + 3 \left( \frac{y}{5x} \right) + \frac{y^3}{125x^3} \\ &= \frac{125x^3}{y^3} + \frac{15x}{y} + \frac{3y}{5x} + \frac{y^3}{125x^3} \end{aligned}$$

## Practice Set 5.3 8th Std Maths Answers Chapter 5 Expansion Formulae

Question 1.

Expand:

i.  $(2m - 5)^3$

ii.  $(4 - p)^3$

iii.  $(7x - 9y)^3$

iv.  $(58)^3$

v.  $(198)^3$

vi.  $(2p - 12p)^3$

vii.  $(1 - 1a)^3$

viii.  $(x^3 - 3x)^3$

Solution:

i. Here,  $a = 2m$  and  $b = 5$

$$(2m - 5)^3$$

$$= (2m)^3 - 3(2m)^2(5) + 3(2m)(5)^2 - (5)^3$$

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

$$= 8m^3 - 3(4m^2)(5) + 3(2m)(25) - 125$$

$$= 8m^3 - 60m^2 + 150m - 125$$

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ii. Here,  $a = 4$  and  $b = p$

$$(4 - p)^3 = (4)^3 - 3(4)^2(p) + 3(4)(p)^2 - (p)^3$$

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

$$= 64 - 3(16)(p) + 3(4)(p^2) - p^3$$

$$= 64 - 48p + 12p^2 - p^3$$

iii. Here,  $a = 7x$  and  $b = 9y$

$$(7x - 9y)^3$$

$$= (7x)^3 - 3(7x)^2(9y) + 3(7x)(9y)^2 - (9y)^3$$

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

$$= 343x^3 - 3(49x^2)(9y) + 3(7x)(81y^2) - 729y^3$$

$$= 343x^3 - 1323x^2y + 1701xy^2 - 729y^3$$

$$\text{iv. } (58)^3 = (60 - 2)^3$$

Here,  $a = 60$  and  $b = 2$

$$(58)^3 = (60)^3 - 3(60)^2(2) + 3(60)(2)^2 - (2)^3$$

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

$$= 216000 - 3(3600)(2) + 3(60)(4) - 8$$

$$= 216000 - 21600 + 720 - 8$$

$$= 195112$$

$$\text{v. } (198)^3 = (200 - 2)^3$$

Here,  $a = 200$  and  $b = 2$

$$(198)^3 = (200)^3 - 3(200)^2(2) + 3(200)(2)^2 - (2)^3$$

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

$$= 8000000 - 3(40000)(2) + 3(200)(4) - 8$$

$$= 8000000 - 240000 + 2400 - 8$$

$$= 7762392$$

vi. Here,  $a = 2p$  and  $b = \frac{1}{2p}$

$$\left(2p - \frac{1}{2p}\right)^3$$

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

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

$$= 8p^3 - 3(2p)(2p) \left(\frac{1}{2p}\right) + 3(2p) \left(\frac{1}{2p}\right) \left(\frac{1}{2p}\right) - \frac{1}{8p^3}$$

$$= 8p^3 - 3(2p) + 3 \left(\frac{1}{2p}\right) - \frac{1}{8p^3}$$

$$= 8p^3 - 6p + \frac{3}{2p} - \frac{1}{8p^3}$$

vii. Here,  $A = 1$  and  $B = \frac{1}{a}$

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

viii. Here,  $a = \frac{x}{3}$  and  $b = \frac{3}{x}$

$$\begin{aligned}\left(\frac{x}{3} - \frac{3}{x}\right)^3 &= \left(\frac{x}{3}\right)^3 - 3\left(\frac{x}{3}\right)^2 \left(\frac{3}{x}\right) \\ &\quad + 3\left(\frac{x}{3}\right) \left(\frac{3}{x}\right)^2 - \left(\frac{3}{x}\right)^3 \\ &\dots [(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3] \\ &= \frac{x^3}{27} - 3\left(\frac{x}{3}\right)\left(\frac{x}{3}\right)\left(\frac{3}{x}\right) + 3\left(\frac{x}{3}\right)\left(\frac{3}{x}\right)\left(\frac{3}{x}\right) - \frac{27}{x^3} \\ &= \frac{x^3}{27} - 3\left(\frac{x}{3}\right) + 3\left(\frac{3}{x}\right) - \frac{27}{x^3} \\ &= \frac{x^3}{27} - x + \frac{9}{x} - \frac{27}{x^3}\end{aligned}$$

Question 2.

Simplify:

i.  $(2a + b)^3 - (2a - b)^3$

ii.  $(3r - 2k)^3 + (3r + 2k)^3$

iii.  $(4a - 3)^3 - (4a + 3)^3$

iv.  $(5x - 7y)^3 + (5x + 7y)^3$

Solution:

i.  $(2a + b)^3 - (2a - b)^3$

$$\begin{aligned}&= [(2a)^3 + 3(2a)^2(b) + 3(2a)(b)^2 + (b)^3] - [(2a)^3 - 3(2a)^2(b) + 3(2a)(b)^2 - (b)^3] \\ &\dots [(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3, (a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3] \\ &= (8a^3 + 12a^2b + 6ab^2 + b^3) - (8a^3 - 12a^2b + 6ab^2 - b^3) \\ &= 8a^3 + 12a^2b + 6ab^2 + b^3 - 8a^3 + 12a^2b - 6ab^2 + b^3 \\ &= 8a^3 - 8a^3 + 12a^2b + 12a^2b + 6ab^2 - 6ab^2 + b^3 + b^3 \\ &= 24a^2b + 2b^3\end{aligned}$$

ii.  $(3r - 2k)^3 + (3r + 2k)^3$

$$\begin{aligned}&= [(3r)^3 - 3(3r)^2(2k) + 3(3r)(2k)^2 - (2k)^3] + [(3r)^3 + 3(3r)^2(2k) + 3(3r)(2k)^2 + (2k)^3] \\ &\dots [(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3, (a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3] \\ &= (27r^3 - 54r^2k + 36rk^2 - 8k^3) + (27r^3 + 54r^2k + 36rk^2 + 8k^3) \\ &= 27r^3 - 54r^2k + 36rk^2 - 8k^3 + 27r^3 + 54r^2k + 36rk^2 + 8k^3 \\ &= 27r^3 + 27r^3 - 54r^2k + 54r^2k + 36rk^2 + 36rk^2 - 8k^3 + 8k^3 \\ &= 54r^3 + 72rk^2\end{aligned}$$



iii.  $(4a - 3)^3 - (4a + 3)^3$

$$= [(4a)^3 - 3(4a)^2(3) + 3(4a)(3)^2 - (3)^3] - [(4a)^3 + 3(4a)^2(3) + 3(4a)(3)^2 + (3)^3]$$

$$\dots [(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3, (a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3]$$

$$= (64a^3 - 144a^2 + 108a - 27) - (64a^3 + 144a^2 + 108a + 27)$$

$$= 64a^3 - 144a^2 + 108a - 27 - 64a^3 - 144a^2 - 108a - 27$$

$$= 64a^3 - 64a^3 - 144a^2 - 144a^2 + 108a - 108a - 27 - 27$$

$$= -288a^2 - 54$$

iv.  $(5x - 7y)^3 + (5x + 7y)^3$

$$= [(5x)^3 - 3(5x)^2(7y) + 3(5x)(7y)^2 - (7y)^3] + [(5x)^3 + 3(5x)^2(7y) + 3(5x)(7y)^2 + (7y)^3]$$

$$\dots [(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3, (a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3]$$

$$= (125x^3 - 525x^2y + 735xy^2 - 343y^3) + (125x^3 + 525x^2y + 735xy^2 + 343y^3)$$

$$= 125x^3 - 525x^2y + 735xy^2 - 343y^3 + 125x^3 + 525x^2y + 735xy^2 + 343y^3$$

$$= 125x^3 + 125x^3 - 525x^2y + 525x^2y + 735xy^2 + 735xy^2 - 343y^3 + 343y^3$$

$$= 250x^3 + 1470xy^2$$

### Maharashtra Board Class 8 Maths Chapter 5 Expansion Formulae Practice Set 5.3 Intext Questions and Activities

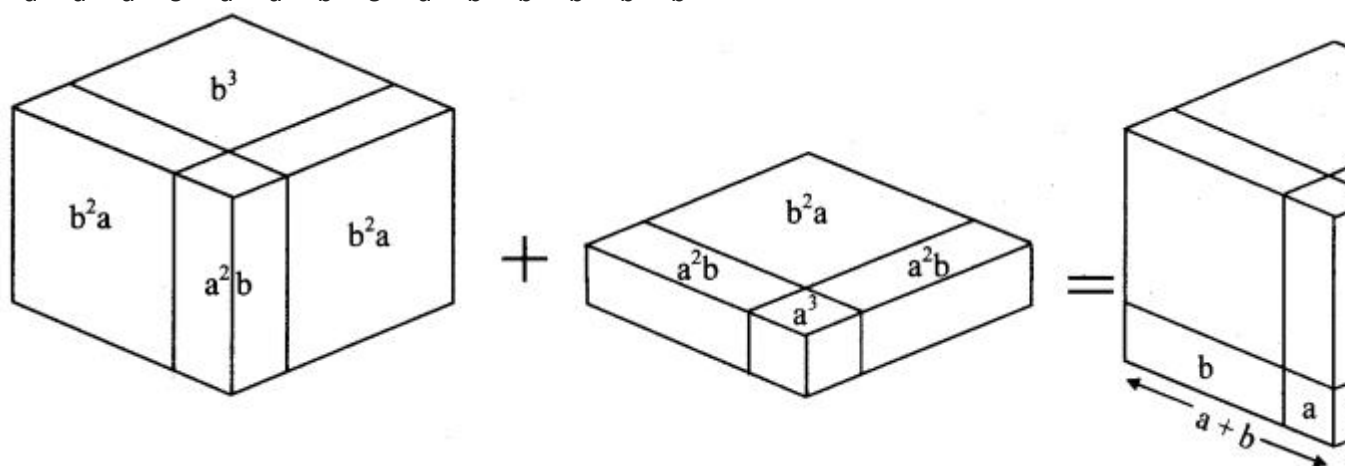
Question 1.

Make two cubes of side  $a$  and of side  $b$  each. Make six parallelopipeds; three of them measuring  $a \times a \times b$  and the remaining three measuring  $b \times b \times a$ . Arrange all these solid figures properly and make a cube of side  $(a + b)$ . (Textbook pg. no. 25)

Solution:

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$= a \times a \times a + 3 \times a \times a \times b + 3 \times a \times b \times b + b \times b \times b$$



## Practice Set 5.4 8th Std Maths Answers Chapter 5 Expansion Formulae

Question 1.

Expand:

i.  $(2p + q + 5)^2$

ii.  $(m + 2n + 3r)^2$

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

iv.  $(7m - 3n - 4k)^2$

Solution:

i.  $(2p + q + 5)^2 = (2p)^2 + (q)^2 + (5)^2 + 2(2p)(q) + 2(q)(5) + 2(2p)(5)$

...  $[(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac]$

$= 4p^2 + q^2 + 25 + 4pq + 10q + 20p$

ii.  $(m + 2n + 3r)^2 = (m)^2 + (2n)^2 + (3r)^2 + 2(m)(2n) + 2(2n)(3r) + 2(m)(3r)$

...  $[(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac]$

$= m^2 + 4n^2 + 9r^2 + 4mn + 12nr + 6mr$

iii.  $(3x + 4y - 5p)^2 = (3x)^2 + (4y)^2 + (-5p)^2 + 2(3x)(4y) + 2(4y)(-5p) + 2(3x)(-5p)$

...  $[(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac]$

$= 9x^2 + 16y^2 + 25p^2 + 24xy - 40py - 30px$

iv.  $(7m - 3n - 4k)^2 = (7m)^2 + (-3n)^2 + (-4k)^2 + 2(7m)(-3n) + 2(-3n)(-4k) + 2(7m)(-4k)$

...  $[(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac]$

$= 49m^2 + 9n^2 + 16k^2 - 42mn + 24nk - 56km$

Question 2.

Simplify:

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

ii.  $(3k - 4r - 2m)^2 - (3k + 4r - 2m)^2$

iii.  $(7a - 6b + 5c)^2 + (7a + 6b - 5c)^2$

Solution:

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

$= [(x)^2 + (-2y)^2 + (3)^2 + 2(x)(-2y) + 2(-2y)(3) + 2(x)(3)] + [(x)^2 + (2y)^2 + (-3)^2 + 2(x)(2y) + 2(2y)(-3) + 2(x)(-3)]$

...  $[(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac]$

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

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

$= 2x^2 + 8y^2 + 18 - 24y$

ii.  $(3k - 4r - 2m)^2 - (3k + 4r - 2m)^2$

$= [(3k)^2 + (-4r)^2 + (-2m)^2 + 2(3k)(-4r) + 2(-4r)(-2m) + 2(3k)(-2m)] - [(3k)^2 + (4r)^2 + (-2m)^2 + 2(3k)(4r) + 2(4r)(-2m) + 2(3k)(-2m)]$

...  $[(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac]$

$= (9k^2 + 16r^2 + 4m^2 - 24kr + 16rm - 12km) - (9k^2 + 16r^2 + 4m^2 + 24kr - 16rm - 12km)$

$= 9k^2 + 16r^2 + 4m^2 - 24kr + 16rm - 12km - 9k^2 - 16r^2 - 4m^2 - 24kr + 16rm + 12km$

$= 9k^2 - 9k^2 + 16r^2 - 16r^2 + 4m^2 - 4m^2 - 24kr - 24kr + 16rm + 16rm - 12km + 12km$

$= 32rm - 48kr$

$$\begin{aligned}
 & \text{iii. } (7a - 6b + 5c)^2 + (7a + 6b - 5c)^2 \\
 &= [(7a)^2 + (-6b)^2 + (5c)^2 + 2(7a)(-6b) + 2(-6b)(5c) + 2(7a)(5c)] + [(7a)^2 + (6b)^2 + (-5c)^2 + \\
 & 2(7a)(6b) + 2(6b)(-5c) + 2(7a)(-5c)] \\
 & \dots [(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ac] \\
 &= 49a^2 + 36b^2 + 25c^2 - 84ab - 60bc + 70ac + 49a^2 + 36b^2 + 25c^2 + 84ab - 60bc - 70ac \\
 &= 49a^2 + 49a^2 + 36b^2 + 36b^2 + 25c^2 + 25c^2 - 84ab + 84ab - 60bc - 60bc + 70ac - 70ac \\
 &= 98a^2 + 72b^2 + 50c^2 - 120bc
 \end{aligned}$$

### Maharashtra Board Class 8 Maths Chapter 5 Expansion Formulae Practice Set 5.4 Intext Questions and Activities

Question 1.

Fill in the boxes with appropriate terms in the steps of expansion. (Textbook pg. no. 27)

$$\begin{aligned}
 & (2p + 3m + 4n)^2 \\
 &= (2p)^2 + (3m)^2 + \underline{\hspace{1cm}} + 2 \times 2p \times 3m + 2 \times \underline{\hspace{1cm}} \times 4n + 2 \times 2p \times \underline{\hspace{1cm}} \\
 &= \underline{\hspace{1cm}} + 9m^2 + \underline{\hspace{1cm}} + 12pm + \underline{\hspace{1cm}} + \underline{\hspace{1cm}}
 \end{aligned}$$

Solution:

$$\begin{aligned}
 & (2p + 3m + 4n)^2 \\
 &= (2p)^2 + (3m)^2 + (4n)^2 + 2 \times 2p \times 3m + 2 \times 3m \times 4n + 2 \times 2p \times 4n \\
 &= 4p^2 + 9m^2 + 16n^2 + 12pm + 24mn + 16pn
 \end{aligned}$$