

## TEXT BOOK EXERCISE 8.3

**Q. 1. Multiply each of the following pairs :**

- (i)  $4x, x + y$                       (ii)  $(x - 3y), x^2$   
 (iii)  $(x + y), 7xy$                 (iv)  $(x^2 - 9x), 4x$   
 (v)  $(a + b), 0$                     (vi)  $(ab + bc), ab$

**Solution.**

$$(i) \quad 4x \times (x + y) = (4x \times x) + (4x \times y) \\ = 4x^2 + 4xy \text{ Ans.}$$

$$(ii) \quad (x - 3y) \times x^2 = x^2 \times (x - 3y) \\ = (x^2 \times x) + (x^2) \times (-3y) \\ = x^3 - 3x^2y \text{ Ans.}$$

$$(iii) \quad (x + y) \times 7xy = 7xy \times (x + y) \\ = (7xy \times x) + (7xy \times y) \\ = 7x^2y + 7xy^2 \text{ Ans.}$$

$$(iv) \quad (x^2 - 9x) \times 4x = 4x \times (x^2 - 9x) \\ = (4x \times x^2) + (4x \times -9x) \\ = 4x^3 - 36x^2 \text{ Ans.}$$

$$(v) \quad (a + b) \times 0 = 0(a + b) \\ = (0 \times a) + (0 \times b) \\ = 0 + 0 = 0 \text{ Ans.}$$

$$(vi) \quad (ab + bc) \times ab = (ab) \times (ab + bc) \\ = (ab \times ab) + (ab \times bc) \\ = a^2b^2 + ab^2c \text{ Ans.}$$

**Q. 2. Complete the table**

First expression	Second expression	Product
(i) $a^2b^2c^2$	$ab + bc + ca$	
(ii) $x + y + z$	$2xy$	
(iii) $p + q - 2r$	$2p$	
(iv) $b + c - a$	$abc$	

**Solution.** (i)  $a^2b^2c^2 \times (ab + bc + ca)$   
 $= (a^2b^2c^2 \times ab) + (a^2b^2c^2 \times bc) + (a^2b^2c^2 \times ca)$   
 $= a^3b^3c^2 + a^2b^3c^3 + a^3b^2c^3 \text{ Ans.}$

(ii)  $(x + y + z) \times (2xy)$   
 $= 2xy \times (x + y + z)$   
 $= (2xy \times x) + (2xy \times y) + (2xy \times z)$   
 $= 2x^2y + 2xy^2 + 2xyz \text{ Ans.}$

(iii)  $(p + q - 2r) \times 2p$   
 $= 2p \times (p + q - 2r)$   
 $= (2p \times p) + (2p \times q) + (2p \times -2r)$   
 $= 2p^2 + 2pq - 4pr \text{ Ans.}$

(iv)  $b + c - a \times abc$   
 $= abc \times (b + c - a)$   
 $= (abc \times b) + (abc \times c) + (abc \times -a)$   
 $= ab^2c + abc^2 - a^2bc \text{ Ans.}$

**Q. 3. Find the Product of :**

(i)  $a^2$  and  $(a^2 - b^2)$

(ii)  $4xy$  and  $(-2x - 3y)$

(iii)  $a$  and  $(a^2 - 2ab + b^2)$

(iv)  $4x^2$  and  $(-x^2 - y^2 + 2x)$

**Solution.**

$$\begin{aligned} \text{(i)} \quad a^2 \times (a^2 - b^2) \\ &= (a^2 \times a^2) + (a^2 \times -b^2) \\ &= a^4 - a^2b^2 \text{ Ans.} \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad 4xy \times (-2x - 3y) \\ &= (4xy \times -2x) + (4xy \times -3y) \\ &= -8x^2y - 12xy^2 \text{ Ans.} \end{aligned}$$

$$\begin{aligned} \text{(iii)} \quad a \times (a^2 - 2ab + b^2) \\ &= (a \times a^2) + (a \times -2ab) + (a \times b^2) \\ &= a^3 - 2a^2b + ab^2 \text{ Ans.} \end{aligned}$$

$$\begin{aligned} \text{(iv)} \quad 4x^2 \times (-x^2 - y^2 + 2x) \\ &= (4x^2 \times -x^2) + (4x^2 \times -y^2) \\ &\quad + (4x^2 \times 2x) \\ &= -4x^4 - 4x^2y^2 + 8x^3 \text{ Ans.} \end{aligned}$$

**Q. 4. Simplify the following and find its value with the given value of the variable**

(i)  $x(3x + 2) - 7$  if  $x = 1$  and  $x = \frac{1}{2}$

(ii)  $y(2y^2 - 7y) + 8$  if  $y = 0$  and  $y = -1$

(iii)  $xy(x^2y - xy^2)$  if  $x = 1, y = 2$

(iv)  $ab(a + ab + abc)$  for  $a = 2, b = 1, c = 0$

**Solution.**

(i)  $x(3x + 2) - 7 = 3x^2 + 2x - 7$  Ans.

For  $x = 1,$

$$\begin{aligned} 3x^2 + 2x - 7 &= 3(1)^2 + 2(1) - 7 \\ &= 3 + 2 - 7 = -2 \text{ Ans.} \end{aligned}$$

For  $x = \frac{1}{2},$

$$\begin{aligned} 3x^2 - 2x - 7 &= 3\left(\frac{1}{2}\right)^2 + 2 \times \frac{1}{2} - 7 \\ &= 3 \times \frac{1}{4} + 1 - 7 = \frac{3}{4} - 6 \\ &= \frac{3 - 24}{4} = -\frac{21}{4} \text{ Ans.} \end{aligned}$$

$$\begin{aligned} \text{(ii)} \quad xy(x^2y - xy^2) \\ &= (xy \times x^2y) + (xy \times -xy^2) \\ &= x^3y^2 - x^2y^3 \text{ Ans.} \end{aligned}$$

For  $x = 1, y = 2,$

$$\begin{aligned} x^3y^2 - x^2y^3 &= (1)^3(2)^2 - (1)^2(2)^3 \\ &= 1 \times 4 - 1 \times 8 \\ &= 4 - 8 = -4 \text{ Ans.} \end{aligned}$$

(iii)  $y(2y^2 - 7y) + 8 = 2y^3 - 7y^2 + 8$  Ans.

For  $y = 0,$

$$\begin{aligned} 2y^3 - 7y^2 + 8 &= 2(0)^3 + 7(0)^2 + 8 \\ &= 0 + 0 + 8 = 8 \text{ Ans.} \end{aligned}$$

For  $y = -1,$

$$\begin{aligned} 2y^3 - 7y^2 + 8 &= 2(-1)^3 - 7(-1)^2 + 8 \\ &= -2 - 7 + 8 \\ &= -9 + 8 = -1 \text{ Ans.} \end{aligned}$$

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

For  $a = 2, b = 1, c = 0,$

$$\begin{aligned} a^2b + a^2b^2 + a^2b^2c \\ &= (2)^2 \times 1 + (2)^2 \times (1)^2 + (2)^2 \times (1)^2 \times (0) \\ &= 4 + 4 + 0 = 8 \text{ Ans.} \end{aligned}$$

**Q. 5. Add :**

(i)  $x(x - y), y(y - z)$  and  $z(z - x)$

(ii)  $2x(x - y - z)$  and  $2y(z - y - x)$

Ans. (i)  $x(x - y) = x^2 - xy$

$$y(y - z) = y^2 - yz$$

$$z(z - x) = z^2 - zx$$

Now, add

$$\begin{array}{r} x^2 - xy \\ \quad + y^2 - yz \\ \quad \quad + z^2 - zx \\ \hline x^2 - xy + y^2 - yz + z^2 - zx \text{ Ans.} \end{array}$$

(ii)  $2x(x - y - z) = 2x^2 - 2xy - 2xz$

and  $2y(z - y - x) = 2yz - 2y^2 - 2xy$

Now, add

$$\begin{array}{r} 2x^2 - 2xy - 2xz \\ \quad - 2xy \quad + 2yz - 2y^2 \\ \hline 2x^2 - 4xy - 2xz + 2yz - 2y^2 \text{ Ans.} \end{array}$$

**Q. 6. Subtract :**

- (i)  $8l(l - 4m + 5n)$  from  $9l(10n - 3m + 2l)$   
 (ii)  $2a(a + b - c) - 2c(a + b - c)$  from  $2c(-a + b + c)$

**Solution.**

(i)  $8l(l - 4m + 5n) = 8l^2 - 32lm + 40ln \dots(i)$

$9l(10n - 3m + 2l) = 90ln - 27lm + 18l^2 \dots(ii)$

Now, subtract (i) from (ii)

$$\begin{array}{r} 18l^2 + 90ln - 27lm \\ 8l^2 + 40ln - 32lm \\ - \quad - \quad + \\ \hline 10l^2 + 50ln + 5lm \quad \text{Ans.} \end{array}$$

(ii)  $2a(a + b - c) - 2c(a + b - c)$   
 $= 2a^2 + 2ab - 2ac - 2ac - 2bc + 2c^2$   
 $= 2a^2 + 2ab - 4ac - 2bc + 2c^2 \dots(i)$

$2c(-a + b + c) = -2ac + 2bc + 2c^2 \dots(ii)$

Now, subtract (i) from (ii)

$$\begin{array}{r} -2ac + 2bc + 2c^2 \\ -4ac - 2bc + 2c^2 + 2a^2 + 2ab \\ + \quad + \quad - \quad - \quad - \\ \hline 2ac + 4bc + 0 \quad -2a^2 - 2ab \\ \hline = 4bc - 2ab + 2ac - 2a^2 \quad \text{Ans.} \end{array}$$

**Q. 7. Subtract sum of  $x(2x + 7) - 2$  and  $3x(x - 2) + 7$  from  $7x - 1$ .**

**Solution.**

$x(2x + 7) - 2 = 2x^2 + 7x - 2 \dots(i)$

and  $3x(x - 2) + 7 = 3x^2 - 6x + 7 \dots(ii)$

Add (i) and (ii)

$$\begin{array}{r} 2x^2 + 7x - 2 \\ 3x^2 - 6x + 7 \\ \hline 5x^2 + x + 5 \end{array}$$

Subtract  $5x^2 + x + 5$  from  $7x - 1$

$$\begin{array}{r} 7x - 1 \\ 5x^2 + x + 5 \\ - \quad - \quad - \\ \hline -5x^2 + 6x - 6 \quad \text{Ans.} \end{array}$$

**Q. 8. Add  $2xy(x + y + z)$  and  $3y(x^2 - xy + xz)$  then subtract from  $5x(xy + y^2 - 4yz)$ .**

**Solution.**

$2xy(x + y + z) = 2x^2y + 2xy^2 + 2xyz \dots(i)$

$3y(x^2 - xy + xz) = 3x^2y - 3xy^2 + 3xyz \dots(ii)$

Adding (i) and (ii)

$$\begin{array}{r} 2x^2y + 2xy^2 + 2xyz \\ 3x^2y - 3xy^2 + 3xyz \\ \hline 5x^2y - xy^2 + 5xyz \quad \dots(iii) \end{array}$$

$5x(xy + y^2 - 4yz) = 5x^2y + 5xy^2 - 20xyz \dots(iv)$

Now, subtract (iii) from (iv)

$$\begin{array}{r} 5x^2y + 5xy^2 - 20xyz \\ 5x^2y - xy^2 + 5xyz \\ - \quad + \quad - \\ \hline 6xy^2 - 25xyz \quad \text{Ans.} \end{array}$$

**Q. 9. Multiple Choice Questions :**

- (i) Product of  $pqr$  and  $p + q + r$  will be :

- (a)  $pqr$   
 (b)  $p^2qr + pq^2r + pqr^2$   
 (c)  $pq + qr + pr$   
 (d)  $p^2qr + pqr^2$

- (ii) Find value of  $x^2 + x$  at  $x = 2$ .

- (a) 4 (b) 6  
 (c) 8 (d) 10.

- (iii) Find  $y \times y^2 \times y^3 \times y^4$

- (a)  $y$  (b)  $y^6$   
 (c)  $y^{10}$  (d)  $y^{25}$

- (iv) Find the product of  $xy + 4z + 3x$  with 0.

- (a)  $xy + yz + 3x$   
 (b)  $xyz$   
 (c) 0  
 (d)  $x^2y^2z^2$

**Ans.** (i) (b)  $p^2qr + pq^2r + pqr^2$

(ii) (b) 6

(iii) (c)  $y^{10}$  (iv) (c) 0.