NCERT solutions for class-8 maths algebraic expressions and identities Ex-9.3

Q1. Carry out the multiplication of the expressions in each of the following pairs:

(i) $4p, q+r$

(ii) $ab, a-b$

(iii) $a+b, 7a^2b^2$

(iv) $a^2-9, 4a$

(v) $pq+qr+rp, 0$

Ans:

(i) $4p \times (q+r) = 4p \times q + 4p \times r$

$= 4pq + 4pr$

(ii) $ab \times (a-b) = ab \times a - ab \times b$

$= a^2b - ab^2$

(iii) $(a+b) \times 7a^2b^2 = a \times 7a^2b^2 + b \times 7a^2b^2$

$= 7a^3b^2 + 7a^2b^3$

(iv) $(a^2-9) \times 4a = a^2 \times 4a - 4a \times 9$

$= 4a^3 - 36a$

(v) $(pq+qr+rp) \times 0 = pq \times 0 + qr \times 0 + rp \times 0$

$= 0 + 0 + 0 = 0$

Q2. Complete the table:

	First expression	Second expression	Product
(i)	a	$b+c+d$	.....
(ii)	$x+y-5$	$5xy$	.....
(iii)	p	$6p^2-7p+5$	.....
(iv)	$4p^2q^2$	p^2-q^2	.....
(v)	$a+b+c$	abc	.....

Ans:

	First expression	Second expression	Product
(i)	a	$b+c+d$	$a(b+c+d)$ $=a\times b+a\times c+a$ $=ab+ac+ad$

(ii)	$x+y-5$	$5xy$	$5xy(x+y-5)$ $=$ $5xy\times x+5xy\times$ $=$ $5x^2y+5xy^2-2$
(iii)	p	$6p^2-7p+5$	$p(6p^2-7p+5$ $=$ $p\times 6p^2-p\times 7$ $=$ $6p^3-7p^2+5p$
(iv)	$4p^2q^2$	p^2-q^2	$4p^2q^2(p^2-q^2$ $=$ $4p^2q^2\times p^2-4$ $=$ $4p^4q^2-4p^2q^4$
(v)	$a+b+c$	abc	$abc(a+b+c)$ $=$ $abc\times a+abc\times$ $=$ a^2bc+ab^2c+a

Q3. Find the product:

(i) $\left(a^2\right)\times\left(2a^{22}\right)\times\left(4a^{26}\right)$

(ii) $\left(\dfrac{2}{3}xy\right)\times\left(\dfrac{-9}{10}x^2y^2\right)$

(iii) $\left(\dfrac{-10}{3}pq^3\right)\times\left(\dfrac{6}{5}p^3q\right)$

(iv) $x\times x^2\times x^3\times x^4$

Ans:

(i) $\left(a^2\right)\times\left(2a^{22}\right)\times\left(4a^{26}\right)$

$=\left(2\times4\right)\left(a^2\times a^{22}\times a^{26}\right)$

$=8\times a^{2+22+26}=8a^{50}$

(ii) $\left(\dfrac{2}{3}xy\right)\times\left(\dfrac{-9}{10}x^2y^2\right)$

$=\left(\dfrac{2}{3}\times\dfrac{-9}{10}\right)\left(x\times x^2\times y\times y^2\right)$

$$= \frac{-3}{5} x^3 y^3$$

(iii) $\left(\frac{-10}{3} pq^3 \right)\left(\frac{6}{5} p^3 q \right)$

$$= \left(\frac{-10}{3} \times \frac{6}{5} \right)\left(p \times p^3 \times q^3 \times q \right)$$

$$= -4 p^4 q^4$$

(iv) $x \times x^2 \times x^3 \times x^4 = x^{1+2+3+4} = x^{10}$

Q4. (a) Simplify: $3x(4x-5)+3$ and find values for

(i) $x=3$

(ii) $x = \frac{1}{2}$.

(b) Simplify: $a(a^2 + a + 1) + 5$ and find its value for

(i) $a = 0$

(ii) $a = 1$

(iii) $a = -1$.

Ans: (a) $3x(4x-5)+3$

$= 3x \times 4x - 3x \times 5 + 3$

$= 12x^2 - 15x + 3$

(i) For $x = 3$, $12x^2 + 15x + 3$

$= 12(3)^2 - 15 \times 3 + 3$

$= 12 \times 9 - 45 + 3 = 108 - 45 + 3 = 66$

(ii) For $x = \dfrac{1}{2}$, $12x^2 - 15x + 3$

$= 12\left(\dfrac{1}{2}\right)^2 - 15 \times \dfrac{1}{2} + 3$

$= 12 \times \dfrac{1}{4} - \dfrac{15}{2} + 3$

$= 6 - \dfrac{15}{2} = \dfrac{12-15}{2} = \dfrac{-3}{2}$

(b) $a(a^2 + a + 1) + 5$

$= a \times a^2 + a \times a + a \times 1 + 5$

$= a^3 + a^2 + a + 5$

(i) For $a = 0$, $a^3 + a^2 + a + 5$

$$= (0)^3 + (0)^2 + (0) + 5$$

$$= 0 + 0 + 0 + 5 = 5$$

(ii) For $a = 1$, $a^3 + a^2 + a + 5$

$$= (1)^3 + (1)^2 + (1) + 5$$

$$= 1 + 1 + 1 + 5 = 8$$

(iii) For $a = -1$, $a^3 + a^2 + a + 5$

$$= (-1)^3 + (-1)^2 + (-1) + 5$$

$$= -1 + 1 - 1 + 5 = -2 + 6 = 4$$

Q5. (a) Add: $p(p-q), q(q-r)$ and $r(r-p)$.

(b) Add: $2x(z-x-y)$ and $2y(z-y-zx)$.

(c) Subtract: $3l(l-4m+5n)$ from $4l(10n-3m+2l)$.

(d) Subtract: $3a(a+b+c) - 2b(a-b+c)$ from $4c(-a+b+c)$.

Ans:

(a) $p(p-q) + q(q-r) + r(r-p)$

$$= p^2 - pq + q^2 - qr + r^2 - rp$$

$$= p^2 + q^2 + r^2 - pq - qr - rp$$

(b) $2x(z-x-y)+2y(z-y-x)$

$= 2xz - 2x^2 - 2xy + 2yz - 2y^2 - 2xy$

$= 2xz - 2xy - 2xy + 2yz - 2x^2 - 2y^2$

$= -2x^2 - 2y^2 - 4xy + 2yz + 2zx$

(c) $4l(10n - 3m + 2l) - 3l(l - 4m + 5n)$

$= 40ln - 12lm + 8l^2 - 3l^2 + 12lm - 15ln$

$= 8l^2 - 3l^2 - 12lm + 12lm + 40ln - 15ln$

$= 5l^2 + 25ln$

(d) $4c(-a+b+c)-\left[3a(a+b+c)-2b(a-b+c)\right]$

$= -4ac + 4bc + 4c^2 - \left[3a^2 + 3ab + 3ac - 2ab + 2b^2 - 2bc\right]$

$= -4ac + 4bc + 4c^2 - \left[3a^2 + 2b^2 + 3ab - 2bc + 3ac - 2ab\right]$

$= -4ac + 4bc + 4c^2 - \left[3a^2 + 2b^2 + ab + 3ac - 2bc\right]$

$= -4ac + 4bc + 4c^2 - 3a^2 - 2b^2 - ab - 3ac + 2bc$

$= -3a^2 - 2b^2 + 4c^2 - ab + 4bc + 2bc - 4ac - 3ac$

$= -3a^2 - 2b^2 + 4c^2 - ab + 6bc - 7ac$

********** END *********