

NCERT SOLUTIONS OF Algebraic Exercise 3

Question 1

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

Answer:

- i) $4p(q + r) = 4pq + 4pr$
ii) $ab(a - b) = a^2b - ab^2$
iii) $(a + b)(7a^2b^2) = 7a^3b^2 + 7a^2b^3$
iv) $(a^2 - 9)(4a) = 4a^3 - 36a^2$
v) $(pq + qr + rp) \times 0 = 0$

Question 2

Find the product.

- i) $a^2 \times (2a^{22}) \times (4a^{26})$
ii) $(2xy/3) \times (-9x^2y^2/10)$
iii) $(-10pq^3/3) \times (6p^3q/5)$
iv) $(x) \times (x^2) \times (x^3) \times (x^8)$

Answer:

We will use the below property extensively in above questions

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$$a^m \times a^n \times a^o = a^{m+n+o}$$

i) As you know

So, we get

$$a^2 \times (2a^{22}) \times (4a^{26}) = 8a^{48}$$

ii) $(2xy/3) \times (-9x^2y^2/10)$

$$=(-3x^3y^3/5)$$

iii) $(-10pq^3/3) \times (6p^3q/5)$

$$=(-4p^4q^4)$$

iv) $(x) \times (x^2) \times (x^3) \times (x^8)$

$$= x^{14}$$

Question 3

(a) Simplify $3x(4x - 5) + 3$ and find its values for (i) $x = 3$ (ii) $x = 1/2$

(b) Simplify $a(a^2 + a + 1) + 5$ and find its value for (i) $a = 0$, (ii) $a = 1$ (iii) $a = -1$.

Answer

a)

i) Putting $x=3$ in the equation we get

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

$$=108-45+3 = 66$$

(ii) putting $x=1/2$ in the equation we get

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

b)

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

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

(i) putting $a=0$ in the equation we get

$$0^3+0^2+0=0$$

(ii) putting $a=1$ in the equation we get

$$1^3 + 1^2 + 1 = 1 + 1 + 1 = 3$$

(iii) Putting $a = -1$ in the equation we get

$$-1^3+1^2-1 = -1 + 1 + 1 = 1$$

Question 5

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

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

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

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

Answer:

$$\begin{aligned} \text{i)} \quad & (p^2 - pq) + (q^2 - qr) + (r^2 - pr) \\ & = p^2 + q^2 + r^2 - pq - qr - pr \end{aligned}$$

$$\begin{aligned} \text{ii)} \quad & (2xz - 2x^2 - 2xy) + (2yz - 2y^2 - 2xy) \\ & = 2xz - 4xy + 2yz - 2x^2 - 2y^2 \end{aligned}$$

$$\begin{aligned} \text{iii)} \quad & (40ln - 12lm + 8l^2) - (3l^2 - 12lm + 15ln) \\ & = 40ln - 12lm + 8l^2 - 3l^2 - 12lm + 15ln \\ & = 55ln - 24lm + 5l^2 \end{aligned}$$

$$\begin{aligned}\text{iv)} &= (-4ac + 4bc + 4c^2) - (3a^2 + 3ab + 3ac) \\ &= -4ac + 4bc + 4c^2 - 3a^2 - 3ab - 3ac \\ &= -7ac + 4bc + 4c^2 - 3a^2 - 3ab\end{aligned}$$

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