Study Material

Exercise 14.3

Question 1.Carry out the following divisions.

(i) $28x^4 \div 56x$ (ii) $-36y^3 \div 9y^2$

(iii) $66pq^2r^3 \div 11qr^2$ (iv) $34x^3y^3z^3 \div 51xy^2z^3$ (v) $12a^8b^8 \div (-6a^6b^4)$

Solution:

$$(i)\ 28x^4 \div 56x = \frac{28x^4}{56x}$$

$$= \frac{2 \times 2 \times 7 \times x \times x \times x \times x}{2 \times 2 \times 2 \times 7 \times x} = \frac{x^3}{2}$$

$$(ii)\ -36y^3 \div 9y^2 = \frac{-36y^3}{9y^2}$$

$$= \frac{(-1) \times 2 \times 2 \times 3 \times 3 \times y \times y \times y}{(-1) \times (-) \times 3 \times y \times 3 \times y} = -4y$$

$$(iii)\ 66pq^2r^3 \div 11qr^2 = \frac{66pq^2r^3}{11qr^2}$$

$$= \frac{2 \times 3 \times 11 \times p \times q \times q \times r \times r \times r}{11 \times q \times r \times r}$$

$$= 6pqr$$

$$(iv)\ 34x^3y^3z^3 \div 51xy^2z^3 = \frac{34x^3y^3z^3}{51xy^2z^3}$$

$$= \frac{2 \times 17 \times x \times x \times x \times y \times y}{3 \times 17 \times x \times y \times y \times z \times z \times z} = \frac{2}{3}x^2y$$

$$(v)\ 12a^8b^8 \div (-6a^6b^4) = \frac{12a^8b^8}{-6a^6b^4}$$

$$= \frac{(-1) \times (-) \times 2 \times 2 \times 3 \times a \times a \times a \times a \times a \times a \times a \times a \times b \times b \times b \times b \times b \times b \times b \times b}{(-1) \times 2 \times 3 \times a \times a \times a \times a \times a \times a \times a \times b \times b \times b \times b}$$

$$= -2a^2b^4$$

Question 2. Divide the following polynomial by the given monomial.

(i) $(5x^2 - 6x) \div 3x$

(ii) $(3y^8 - 4y^6 + 5y^4) \div y^4$

(iii) $8(x^3y^2z^2 + x^2y^3z^2 + x^2y^2z^3) \div 4x^2y^2z^2$

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

(v) $(p^3q^6 - p^6q^3) \div p^3q^3$

Solution:

$$(i)\ (5x^2 - 6x) \div 3x = \frac{(5x^2 - 6x)}{3x}$$

$$= \frac{\cancel{x}\,(5x - 6)}{3\cancel{x}} = \frac{(5x - 6)}{3}$$

$$(ii)\ (3y^8 - 4y^6 + 5y^4) \div y^4$$

$$= \frac{3y^8 - 4y^6 + 5y^4}{y^4}$$

$$= \frac{\cancel{y^4}\left(3y^4 - 4y^2 + 5\right)}{\cancel{y^4}}$$

$$= 3y^4 - 4y^2 + 5$$

$$(iii)\ 8(x^3y^2z^2 + x^2y^3z^2 + x^2y^2z^3) \div 4x^2y^2z^2$$

$$= \frac{8\left(x^3y^2z^2 + x^2y^3z^2 + x^2y^2z^3\right)}{4x^2y^2z^2}$$

$$= \frac{\cancel{8}^{2}\,\cancel{x^2}\,\cancel{y^2}\,\cancel{z^2}\,(x + y + z)}{\cancel{4}\,\cancel{x^2}\,\cancel{y^2}\,\cancel{z^2}}$$

$$= 2(x + y + z)$$

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

$$= \frac{x^3 + 2x^2 + 3x}{2x} = \frac{\cancel{x}\left(x^2 + 2x + 3\right)}{2\cancel{x}}$$

$$= \frac{x^2 + 2x + 3}{2}$$

$$(v)\ (p^3q^6 - p^6q^3) \div p^3q^3 = \frac{p^3q^6 - p^6q^3}{p^3q^3}$$

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