

**CBSE Class –VIII Mathematics**  
**NCERT Solutions**  
**CHAPTER - 14**  
**Factorisation (Ex. 14.3)**

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)  $12a^8b^8 \div (-6a^6b^4)$

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

$$= \frac{28}{56} \times \frac{x^4}{x}$$

$$= \frac{1}{2} x^3 \quad \left[ \because x^m \div x^n = x^{m-n} \right]$$

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

$$= \frac{-36}{9} \times \frac{y^3}{y^2}$$

$$= -4y \quad \left[ \because x^m \div x^n = x^{m-n} \right]$$

(iii)  $66pq^2r^3 \div 11qr^2$

$$\begin{aligned} &= \frac{66pq^2r^3}{11qr^2} \\ &= \frac{66}{11} \times \frac{pq^2r^3}{qr^2} \\ &= 6pqr \quad \left[ \because x^m \div x^n = x^{m-n} \right] \end{aligned}$$

(iv)  $34x^3y^3z^3 \div 51xy^2z^3$

$$\begin{aligned} &= \frac{34x^3y^3z^3}{51xy^2z^3} \\ &= \frac{34}{51} \times \frac{x^3y^3z^3}{xy^2z^3} \\ &= \frac{2}{3}x^2y \quad \left[ \because x^m \div x^n = x^{m-n} \right] \end{aligned}$$

(v)  $12a^8b^8 \div (-6a^6b^4)$

$$\begin{aligned} &= \frac{12a^8b^8}{-6a^6b^4} \\ &= \frac{12}{-6} \times \frac{a^8b^8}{a^6b^4} \\ &= -2a^2b^4 \quad \left[ \because x^m \div x^n = x^{m-n} \right] \end{aligned}$$

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**2. Divide the given 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)  $(p^3q^6 - p^6q^3) \div p^3q^3$

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

$$= \frac{5x^2 - 6x}{3x}$$

$$= \frac{5x^2}{3x} - \frac{6x}{3x} = \frac{5}{3}x - 2 = \frac{1}{3}(5x - 6)$$

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

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

$$= \frac{3y^8}{y^4} - \frac{4y^6}{y^4} + \frac{5y^4}{y^4} = 3y^4 - 4y^2 + 5$$

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

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

$$= \frac{8x^3y^2z^2}{4x^2y^2z^2} + \frac{8x^2y^3z^2}{4x^2y^2z^2} + \frac{8x^2y^2z^3}{4x^2y^2z^2}$$

$$= 2x + 2y + 2z$$

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

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

$$\begin{aligned} &= \frac{x^3 + 2x^2 + 3x}{2x} \\ &= \frac{x^3}{2x} + \frac{2x^2}{2x} + \frac{3x}{2x} = \frac{x^2}{2} + \frac{2x}{2} + \frac{3}{2} \\ &= \frac{1}{2}(x^2 + 2x + 3) \end{aligned}$$

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

$$\begin{aligned} &= \frac{p^3q^6 - p^6q^3}{p^3q^3} \\ &= \frac{p^3q^6}{p^3q^3} - \frac{p^6q^3}{p^3q^3} = q^3 - p^3 \end{aligned}$$

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**3. Work out the following divisions:**

(i)  $(10x - 25) \div 5$

(ii)  $(10x - 25) \div (2x - 5)$

(iii)  $10y(6y + 21) \div 5(2y + 7)$

(iv)  $9x^2y^2(3z - 24) \div 27xy(z - 8)$

(v)  $96abc(3a - 12)(5b - 30) \div 144(a - 4)(b - 6)$

**Ans. (i)**  $(10x - 25) \div 5 = \frac{10x - 25}{5}$

$$= \frac{5(2x - 5)}{5} = 2x - 5$$

$$(ii) (10x - 25) \div (2x - 5) = \frac{10x - 25}{(2x - 5)}$$

$$= \frac{5(2x - 5)}{(2x - 5)} = 5$$

$$(iii) 10y(6y + 21) \div 5(2y + 7)$$

$$= \frac{10y(6y + 21)}{5(2y + 7)}$$

$$= \frac{2 \times 5 \times y \times 3(2y + 7)}{5(2y + 7)} = 2 \times y \times 3 = 6y$$

$$(iv) 9x^2y^2(3z - 24) \div 27xy(z - 8)$$

$$= \frac{9x^2y^2(3z - 24)}{27xy(z - 8)}$$

$$= \frac{9}{27} \times \frac{xy \times xy \times 3(z - 8)}{xy(z - 8)} = xy$$

$$(v) 96abc(3a - 12)(5b - 30) \div 144(a - 4)(b - 6)$$

$$= \frac{96abc(3a - 12)(5b - 30)}{144(a - 4)(b - 6)}$$

$$= \frac{12 \times 4 \times 2 \times abc \times 3(a - 4) \times 5(b - 6)}{12 \times 4 \times 3(a - 4)(b - 6)}$$

$$= 10abc$$

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**4. Divide as directed:**

(i)  $5(2x+1)(3x+5) \div (2x+1)$

(ii)  $26xy(x+5)(y-4) \div 13x(y-4)$

(iii)  $52pqr(p+q)(q+r)(r+p) \div 104pq(q+r)(r+p)$

(iv)  $20(y+4)(y^2+5y+3) \div 5(y+4)$

(v)  $x(x+1)(x+2)(x+3) \div x(x+1)$

**Ans. (i)**  $5(2x+1)(3x+5) \div (2x+1)$

$$= \frac{5(2x+1)(3x+5)}{(2x+1)}$$

$$= 5(3x+5)$$

(ii)  $26xy(x+5)(y-4) \div 13x(y-4)$

$$26xy(x+5)(y-4) \div 13x(y-4)$$

$$= \frac{26xy(x+5)(y-4)}{13x(y-4)}$$

$$= \frac{13 \times 2 \times xy(x+5)(y-4)}{13x(y-4)} = 2y(x+5)$$

(iii)

$$52pqr(p+q)(q+r)(r+p) \div 104pq(q+r)(r+p)$$

$$= \frac{52pqr(p+q)(q+r)(r+p)}{52 \times 2 \times pq(q+r)(r+p)}$$

$$= \frac{1}{2}r(p+q)$$

(iv)

$$\begin{aligned} & 20(y+4)(y^2+5y+3) \div 5(y+4) \\ &= \frac{20(y+4)(y^2+5y+3)}{5(y+4)} \\ &= 4(y^2+5y+3) \end{aligned}$$

(v)

$$\begin{aligned} & x(x+1)(x+2)(x+3) \div x(x+1) \\ &= \frac{x(x+1)(x+2)(x+3)}{x(x+1)} \\ &= (x+2)(x+3) \end{aligned}$$

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**5. Factorize the expressions and divide them as directed:**

(i)  $(y^2 + 7y + 10) \div (y + 5)$

(ii)  $(m^2 - 14m - 32) \div (m + 2)$

(iii)  $(5p^2 - 25p + 20) \div (p - 1)$

(iv)  $4yz(z^2 + 6z - 16) \div 2y(z + 8)$

(v)  $5pq(p^2 - q^2) \div 2p(p + q)$

(vi)  $12xy(9x^2 - 16y^2) \div 4xy(3x + 4y)$

(vii)  $39y^3(50y^2 - 98) \div 26y^2(5y + 7)$

**Ans. (i)**  $(y^2 + 7y + 10) \div (y + 5)$

$$= \frac{y^2 + 7y + 10}{(y + 5)}$$

$$= \frac{y^2 + (2 + 5)y + 2 \times 5}{(y + 5)}$$

$$= \frac{y^2 + 2y + 5y + 2 \times 5}{(y + 5)}$$

$$= \frac{(y + 2)(y + 5)}{(y + 5)} \quad \left[ \because x^2 + (a + b)x + ab = (x + a)(x + b) \right]$$

$$= y + 2$$

**(ii)**  $(m^2 - 14m + 32) \div (m + 2)$

$$= \frac{m^2 - 14m + 32}{(m + 2)}$$

$$= \frac{m^2 + (-16 + 2)m + (-16) \times 2}{(m + 2)}$$

$$= \frac{(m - 16)(m + 2)}{(m + 2)} \quad \left[ \because x^2 + (a + b)x + ab = (x + a)(x + b) \right]$$

$$= (m - 16)$$

**(iii)**  $(5p^2 - 25p + 20) \div (p - 1)$

$$= \frac{5p^2 - 25p + 20}{(p - 1)}$$



$$= \frac{5p^2 - 20p - 5p + 20}{(p-1)}$$

$$= \frac{5p(p-4) - 5(p-4)}{(p-1)}$$

$$= \frac{(5p-5)(p-4)}{(p-1)} = \frac{5(p-1)(p-4)}{(p-1)}$$

$$= 5(p-4)$$

(iv)  $4yz(z^2 + 6z - 16) \div 2y(z+8)$

$$= \frac{4yz(z^2 + 6z - 16)}{2y(z+8)}$$

$$= \frac{4yz[z^2 + (8-2)z + 8 \times (-2)]}{2y(z+8)}$$

$$= \frac{4yz(z-2)(z+8)}{2y(z+8)} \quad [\because x^2 + (a+b)x + ab = (x+a)(x+b)]$$

$$= 2z(z-2)$$

(v)  $5pq(p^2 - q^2) \div 2p(p+q)$

$$= \frac{5pq(p^2 - q^2)}{2p(p+q)}$$

$$= \frac{5pq(p-q)(p+q)}{2p(p+q)} \quad [\because a^2 - b^2 = (a-b)(a+b)]$$

$$= \frac{5}{2}q(p-q)$$

(vi)  $12xy(9x^2 - 16y^2) \div 4xy(3x + 4y)$

$$= \frac{12xy(9x^2 - 16y^2)}{4xy(3x + 4y)}$$

$$= \frac{12xy[(3x)^2 - (4y)^2]}{4xy(3x + 4y)}$$

$$= \frac{12xy(3x - 4y)(3x + 4y)}{4xy(3x + 4y)} \quad [\because a^2 - b^2 = (a - b)(a + b)]$$

$$= 3(3x - 4y)$$

(vii)  $39y^3(50y^2 - 98) \div 26y^2(5y + 7)$

$$= \frac{39y^3(50y^2 - 98)}{26y^2(5y + 7)}$$

$$= \frac{39y^3 \times 2(25y^2 - 49)}{26y^2(5y + 7)}$$

$$= \frac{39y^3 \times 2[(5y)^2 - (7)^2]}{26y^2(5y + 7)} \text{ change the image with image\_3312\_1}$$

$$= \frac{39y^3 \times 2(5y - 7)(5y + 7)}{26y^2(5y + 7)} \quad [\because a^2 - b^2 = (a - b)(a + b)] \text{ change the image with}$$

image\\_3312\\_2

$$= 3y(5y - 7)$$