NCERT solutions for class-8 maths chapter-14 factorisation Ex-14.3

Q1. 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) $12a^8b^8 \div \left(-6a^6b^4\right)$

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

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

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

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

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

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

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

$= \dfrac{66pq^2r^3}{11qr^2}$

$= \dfrac{66}{11} \times \dfrac{pq^2r^3}{qr^2}$

$= 6pqr \left[\because \ x^m \div x^n = x^{m-n}\right]$

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

$= \dfrac{34x^3y^3z^3}{51xy^2z^3}$

$= \dfrac{34}{51} \times \dfrac{x^3y^3z^3}{xy^2z^3}$

$= \dfrac{2}{3}x^2y \left[\because \ x^m \div x^n = x^{m-n}\right]$

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

$= \dfrac{12a^8b^8}{-6a^6b^4}$

$= \dfrac{12}{-6} \times \dfrac{a^8b^8}{a^6b^4}$

$= -2a^2b^4 \left[\because \ x^m \div x^n = x^{m-n}\right]$

Q2. Divide the given polynomial by the given monomial:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

$$=\frac{1}{2}\left(x^2+2x+3\right)$$

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

$$=\frac{p^3q^6-p^6q^3}{p^3q^3}$$

$$=\frac{p^3q^6}{p^3q^3}-\frac{p^6q^3}{p^3q^3}=q^3-p^3$$

Q3. 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) $96abc(3a-12)(5b-30)\div 144(a-4)(b-6)$

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

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

$$= 10abc$$

Q4. 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)

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

$$= \frac{20(y+4)\left(y^2+5y+3\right)}{5(y+4)}$$

$$= 4\left(y^2+5y+3\right)$$

(v)

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

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

$$= (x+2)(x+3)$$

Q5. Factorize the expressions and divide them as directed:

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

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

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

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

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

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

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

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

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

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

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

$$=\frac{\left(y+2\right)\left(y+5\right)}{\left(y+5\right)}$$

$$\left[\because x^2+\left(a+b\right)x+ab=\left(x+a\right)\left(x+b\right)\right]$$

$$=y+2$$

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

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

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

$$-\frac{\left(m-16\right)\left(m+2\right)}{\left(m+2\right)}$$

$$\left[\because x^2+\left(a+b\right)x+ab=\left(x+a\right)\left(x+b\right)\right]$$

$$=\left(m+2\right)$$

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

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

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

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

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

$$=5\left(p-4\right)$$

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

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

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

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

$$\left[\because x^2+(a+b)x+ab=(x+a)(x+b)\right]$$

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

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

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

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

$$\left[\because\ a^2-b^2=(a-b)(a+b)\right]$$

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

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

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

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

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

$$\left[\because\ a^2-b^2=(a-b)(a+b)\right]$$

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

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

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

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

$$= \frac{39y^2\times 2\left[(5y)^2-(7)^2\right]}{26y^2(5y+7)}$$

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

$$\left[\because\ a^2-b^2=(a-b)(a+b)\right]$$

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

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