NCERT SOLUTIONS OF Factorization Exercise 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) $12a^8b^8 \div (-6a^6b^4)$

Answer:

i) $28x^4 \div 56x$

$= (2\times2\times7\times x\times x^3) / (2\times2\times2\times7\times x)$

$= x^3/2$

ii) $-36y^3 \div 9y^2$

$= (-2\times2\times3\times3\times y\times y^2) / (3\times3\times y^2)$

$= -4y$

iii) $66pq^2r^3 \div 11qr^2$
$= 6pqr$

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

v) $12a^8b^8 \div (-6a^6b^4)$
$= -2a^2b^4$

Question 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) $(p^3q^6 – p^6q^3) \div p^3q^3$

Answer:

i) $(5x^2 – 6x) \div 3x$
$=[x(5x-6)] \ / \ 3x$
Cancelling x
$=(5x-6)/3$

ii) $(3y^8 – 4y^6 + 5y^4) \div y^4$
$= y^4(3y^4 -4y^2 +5)/ y^4$
$=3y^4-4y^2+5$

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

$= 2(x+y+z)$

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

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

$=(q^3 - p^3)$

Question 3

Work out the following divisions.

(i) (10x – 25) ÷ 5

(ii) (10x – 25) ÷ (2x – 5)

(iii) 10y(6y + 21) ÷ 5(2y + 7)

(iv) $9x^2y^2$ (3z – 24) ÷ 27xy(z – 8)

(v) 96abc(3a – 12) (5b – 30) ÷ 144(a – 4) (b – 6)

Answer

i) (10x – 25) ÷ 5

=5(2x-5)/5

=(2x-5)

ii) (10x – 25) ÷ (2x – 5)
= 5(2x-5) /(2x – 5)
=-5

iii) 10y(6y + 21) ÷ 5(2y + 7)

=30y(2y+7)/ 5(2y + 7)

= 6y

iv) $9x^2y^2$ (3z – 24) ÷ 27xy(z – 8)
$=27\ x^2y^2(z-8)/\ 27xy(z – 8)$
=xy

v) 96abc(3a – 12) (5b – 30) ÷ 144(a – 4) (b – 6)
=(96×3×5)abc(a-4)(b-6)/ 144(a – 4) (b – 6)

=10abc

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

Answer

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

$=5(2x + 1)(3x + 5) / (2x + 1)$

$=5(3x+5)$

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

$=26xy(x + 5)(y - 4) / 13x(y - 4)$

Cancelling 13x(y-4)

$=2y(x+5)$

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

$=52pqr(p + q)(q + r)(r + p)/ 104pq(q + r)(r + p)$

Cancelling $52pq(q + r)(r + p)$

$=r(p+q)/2$

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

$=4(y^2 + 5y + 3)$

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

$= x(x + 1)(x + 2)(x + 3) / x(x + 1)$

Cancelling $x(x + 1)$

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

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

Answer

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

$=(y^2 + 5y+2y + 10)/(y+5)$

$=[y(y+5)+2(y+5)] /(y+5)$

$=(y+1)(y+5) /(y+5)$

$=(y+1)$

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

$= (m^2 - 16m+2m - 32) / (m + 2)$

$=[m(m-16)+2(m-16)] /(m+2)$

$=(m+2)(m-16) /(m+2$

$=(m-16)$

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

$=5(p^2-5p+4)/(p-1)$

$=5[p(p-1) -4(p-1)] /(p-1)$

$=5(p-1)(p-4)/(p-1)$

$=5(p-4)$

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

$=4yz[z^2 -2z+8z-16]/ 2y(z + 8)$

$=4yz[z(z-2)+8(z-2)] / 2y(z + 8)$

$=4yz(z-2)(z+8) / 2y(z + 8)$

$=2z(z-2)$

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

$=5pq(p^2 - q^2) / 2p(p + q)$

$=5pq(p-q)(p+q) / 2p(p + q)$

$=5q(p-q)/2$

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

$=12xy(9x^2 - 16y^2) / 4xy(3x + 4y)$

$=12xy(3x+4y)(3x-4y) / 4xy(3x + 4y)$

$=3(3x-4y)$

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

$=39y^3(50y^2 - 98) /26y^2(5y + 7)$

$=78y^3(25y^2-49)/\ 26y^2(5y+7)$

$=3y(5y+7)(5y-7)/\ (5y+7)$

$=3y(5y-7)$