NCERT solutions for class 8 maths chapter 14 factorisation Ex 14.1

Q1. Find the common factors of the given terms.

(i) $12x, 36$

(ii) $2y, 22xy$

(iii) $14pq, 28p^2q^2$

(iv) $2x, 3x^2, 4$

(v) $6abc, 24ab^2, 12a^2b$

(vi) $16x^3, -4x^2, 32x$

(vii) $10pq, 20qr, 30rp$

(viii) $3x^2y^3, 10x^3y^2, 6x^2y^2z$

Ans. (i) $12x = 2 \times 2 \times 3 \times x$

$36 = 2 \times 2 \times 3 \times 3$

Hence, the common factors are 2, 2 and $3 = 2 \times 2 \times 3 = 12$

(ii) $2y = 2 \times y$

$22xy = 2 \times 11 \times x \times y$

Hence the common factors are

2 and $y = 2 \times y = 2y$

(iii) $14pq = 2 \times 7 \times p \times q$

$28p^2q^2 = 2 \times 2 \times 7 \times p \times p \times q \times q$

Hence the common factors are

$2 \times 7 \times p \times q = 14pq$

(iv) $2x = 2 \times x \times 1$

$3x^2 = 3 \times x \times x \times 1$

$4 = 2 \times 2 \times 1$

Hence the common factor is 1.

(v) $6abc = 2 \times 3 \times a \times b \times c$

$24ab^2 = 2 \times 2 \times 2 \times 3 \times a \times b \times b$

$12a^2b = 2 \times 2 \times 3 \times a \times a \times b$

Hence the common factors are
$2 \times 3 \times a \times b = 6ab$

(vi) $16x^3 = 2 \times 2 \times 2 \times 2 \times x \times x \times x$

$-4x^2 = (-1) \times 2 \times 2 \times x \times x$

$32x = 2 \times 2 \times 2 \times 2 \times 2 \times x$

Hence the common factors are $2 \times 2 \times x = 4x$

(vii) $10pq = 2 \times 5 \times p \times q$

$20qr = 2 \times 2 \times 5 \times q \times r$

$30rp = 2 \times 3 \times 5 \times r \times p$

Hence the common factors are $2 \times 5 = 10$

(viii) $3x^2y^3 = 3 \times x \times x \times y \times y \times y$

$10x^3y^2 = 2 \times 5 \times x \times x \times x \times y \times y$

$6x^2y^2z = 2 \times 3 \times x \times x \times y \times y \times z$

Hence the common factors are
$x \times x \times y \times y = x^2y^2$

Q2. Factorize the following expressions.

(i) $7x-42$

(ii) $6p-12q$

(iii) $7a^2+14a$

(iv) $-16z+20z^3$

(v) $20l^2m+30alm$

(vi) $5x^2y-15xy^2$

(vii) $10a^2-15b^2+20c^2$

(viii) $-4a^2+4ab-4ca$

(ix) $x^2yz+xy^2z+xyz^2$

(x) ax^2y+bxy^2+cxyz

Ans.

(i) $7x-42=7\times x-2\times3\times7$

Taking common factors from each term,

$=7(x-2\times3)$

$=7(x-6)$

(ii) $6p-12q=2\times3\times p-2\times2\times3\times q$

Taking common factors from each term,

$=2\times3(p-2q)$

$=6(p-2q)$

(iii) $7a^2+14a=7\times a\times a+2\times 7\times a$

Taking common factors from each term,

$=7\times a(a+2)$

$=7a(a+2)$

(iv)

$-16z+20z^3$

$=(-1)\times 2\times 2\times 2\times 2\times z+2\times 2\times 5\times z\times z\times z$

Taking common factors from each term,

$=2\times 2\times z(-2\times 2+5\times z\times z)$

$=4z\left(-4+5z^2\right)$

(v)

$20l^2m+30alm$

$=2\times 2\times 5\times l\times l\times m+2\times 3\times 5\times a\times l\times m$

Taking common factors from each term,

$=2\times 5\times l\times m(2\times l+3\times a)$

$=10lm(2l+3a)$

(vi) $5x^2y-15xy^2=5\times x\times x\times y+3\times 5\times x\times y\times y$

Taking common factors from each term,

$=5\times x\times y(x-3y)$

$=5xy(x-3y)$

(vii)

$10a^2 - 15b^2 + 20c^2$

$= 2 \times 5 \times a \times a - 3 \times 5 \times b \times b + 2 \times 2 \times 5 \times c \times c$

Taking common factors from each term,

$= 5(2 \times a \times a - 3 \times b \times b + 2 \times 2 \times c \times c)$

$= 5(2a^2 - 3b^2 + 4c^2)$

(viii)

$-4a^2 + 4ab - 4ca$

$= (-1) \times 2 \times 2 \times a \times a + 2 \times 2 \times a \times b - 2 \times 2 \times c \times a$

Taking common factors from each term,

$= 2 \times 2 \times a(-a + b - c)$

$= 4a(-a + b + c)$

(ix)

$x^2yz + xy^2z + xyz^2$

$= x \times x \times y \times z + x \times y \times y \times z + x \times y \times z \times z$

Taking common factors from each term,

$= x \times y \times z(x + y + z)$

$= xyz(x + y + z)$

(x)

$ax^2y + bxy^2 + cxyz$

$= a \times x \times x \times y + b \times x \times y \times y + c \times x \times y \times z$

Taking common factors from each term,

$= x \times y(a \times x + b \times y + c \times z)$

$= xy(ax + by + cz)$

Q3. Factorize:

(i) $x^2 + xy + 8x + 8y$

(ii) $15xy - 6x + 5y - 2$

(iii) $ax + bx - ay - by$

(iv) $15pq + 15 + 9q + 25p$

(v) $z - 7 + 7xy - xyz$

Ans.(i) $x^2+xy+8x+8y=x(x+y)+8(x+y)$

$=(x+y)(x+8)$

(ii) $15xy-6x+5y-2=3x(5y-2)+1(5y-2)$

$=(5y-2)(3x+1)$

(iii) $ax+bx-ay-by=(ax+bx)-(ay+by)=$

$x(a+b)-y(a+b)$

$=(a+b)(x-y)$

(iv)

$15pq+15+9q+25p=15pq+25p+9q+15$

$=5p(3q+5)+3(3q+5)$

$=(3q+5)(5p+3)$

(v) $z-7+7xy-xyz=7xy-7-xyz+z$

$=7(xy-1)-z(xy-1)$

$=(xy-1)(7-z)=(-1)(1-xy)(-1)(z-7)$

$=(1-xy)(z-7)$

********** END **********