

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, 24ab2, 12a2b
- (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

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

(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

$$x \times x \times y \times y = x^2 y^2$$

Q2. Factorize the following expressions.

(i)
$$7x-42$$

(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)
$$7x-42 = 7 \times x-2 \times 3 \times 7$$

Taking common factors from each term,

$$= 7(x-2\times3)$$

$$= 7(x-6)$$

(ii)
$$6p-12q = 2 \times 3 \times p - 2 \times 2 \times 3 \times q$$

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,

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

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

$$-16z + 20z^3$$

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

Taking common factors from each term,

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

$$=4z(-4+5z^2)$$

(v)

$$20l^2m + 30alm$$

$$=2\times2\times5\times l\times l\times m+2\times3\times5\times a\times l\times m$$

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,

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

$$=5xy(x-3y)$$

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

$$=2\times5\times a\times a-3\times5\times b\times b+2\times2\times5\times c\times c$$

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,

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

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

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

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

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 *******