



SpeedLabs

MATHS

CBSE 7th

TEEVRA EDUTECH PVT. LTD.

Algebraic Expressions

Exercise-12.1

Q.1 Get the algebraic expressions in the following cases using variables, constants and arithmetic operations.

- (i) Subtraction of z from y.
- (ii) One-half of the sum of numbers x and y.
- (iii) The number z multiplied by itself.
- (iv) One-fourth of the product of numbers p and q.
- (v) Numbers x and y both squared and added.
- (vi) Number 5 added to three times the product of number m and n.
- (vii) Product of numbers y and z subtracted from 10.
- (viii) Sum of numbers a and b subtracted from their product.

Sol: (i) $y - z$ (ii) $\frac{1}{2}(x + y)$ (iii) z^2 (iv) $\frac{1}{2}(pq)$
 (v) $x^2 + y^2$ (vi) $5 + 3(mn)$ (vii) $10 - yz$ (viii) $ab - (a + b)$

Q.2 (i) Identify the terms and their factors in the following expressions

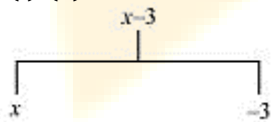
Show the terms and factors by tree diagrams.

- (a) $x - 3$ (b) $1 + x + x^2$ (c) $y - y^3$ (d) $5xy^2 + 7x^2y$ (e) $-ab + 2b^2 - 3a^2$

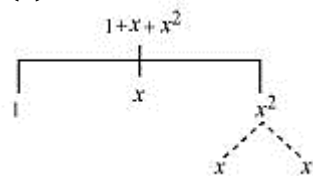
(ii) Identify terms and factors in the expressions given below:

- (a) $-4x + 5$ (b) $-4x + 5y$ (c) $5y + 3y^2$ (d) $xy + 2x^2y^2$ (e) $pq + q$
 (f) $1.2ab - 2.4b + 3.6a$ (g) $\frac{3}{4}x + \frac{1}{4}$ (h) $0.1p^2 + 0.2q^2$

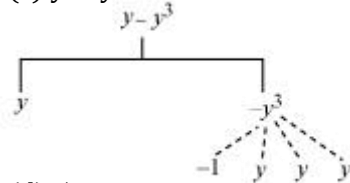
Sol: (i) (a) $x - 3$



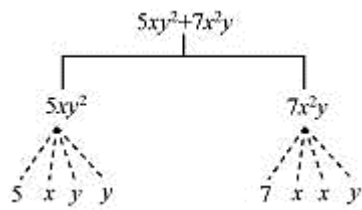
(b) $1 + x + x^2$



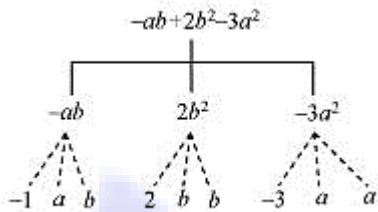
(c) $y - y^3$



(d) $5xy^2 + 7x^2y$



(e) $-ab + 2b^2 - 3a^2$



(ii)

Row	Expression	Terms	Factors
(a)	$-4x + 5$	$-4x, 5$	$-4, x; 5$
(b)	$-4x + 5y$	$-4x, 5y$	$-4, x; 5y$
(c)	$5y + 3y^2$	$5y, 3y^2$	$5, y; 3, y, y$
(d)	$xy + 2x^2y^2$	$xy, 2x^2y^2$	$x, y; 2x, x, y, y$
(e)	$pq + q$	pq, q	$p, q; q$
(f)	$1.2ab - 2.4b + 3.6a$	$1.2ab, 2.4b, 3.6a$	$1.2, a, b; -2.4, b; 3.6, a$
(g)	$\frac{3}{4}x + \frac{1}{4}$	$\frac{3}{4}x, \frac{1}{4}$	$\frac{3}{4}, x; \frac{1}{4}$
(h)	$0.1p^2 + 0.2q^2$	$0.1p^2, 0.2q^2$	$0.1, p, p; 0.2, q, q$

Q.3 Identify the numerical coefficients of terms (other than constants) in the following expressions:

(i) $5 - 3t^2$

(ii) $1 + t + t^2 + t^3$

(iii) $x + 2xy + 3y$

(iv) $100m + 1000n$

(v) $-p^2q^2 + 7pq$

(vi) $1.2a + 0.8b$

(vii) $3.14r^2$

(viii) $2(1 + b)$

(ix) $0.1y + 0.01y^2$

Sol:

Row	Expression	Terms	Coefficients
(i)	$5 - 3t^2$	$3t^2$	-3
(ii)	$1 + t + t^2 + t^3$	t, t^2, t^3	$1, 1, 1$
(iii)	$x + 2xy + 3y$	$x, 2xy, 3y$	$1, 2, 3$
(iv)	$100m + 1000n$	$100m, 1000n$	$100, 1000$

(v)	$-p^2q^2 + 7pq$	$-p^2q^2, 7pq$	$-1, 7$
(vi)	$1.2a + 0.8b$	$1.2a, 0.8b$	$1.2, 0.8$
(vii)	$3.14 r^2$	$3.14 r^2$	3.14
(viii)	$2(1 + b) = 2l + 2b$	$2l, 2b$	$2, 2$
(ix)	$0.1y + 0.01 y^2$	$0.1y, 0.01 y^2$	$0.1, 0.01$

Q.4 (a) Identify terms which contain x and give the coefficient of x.

(i) $y^2x + y$ (ii) $13y^2 - 8yx$ (iii) $x + y + 2$ (iv) $5 + z + zx$

(v) $1 + x + xy$ (vi) $12xy^2 + 25$ (vii) $7x + xy^2$

(b) Identify terms which contain y^2 and give the coefficient of y^2 .

(i) $8 - xy^2$ (ii) $5y^2 + 7x$ (iii) $2x^2y - 15xy^2 + 7y^2$

Sol: (a)

Row	Expression	Term with x	Coefficients of x
(i)	$y^2x + y$	y^2x	y^2
(ii)	$13y^2 - 8yx$	$8yx$	$-8y$
(iii)	$x + y + 2$	x	1
(iv)	$5 + z + zx$	zx	z
(v)	$1 + x + xy$	$x ; xy$	$1 ; y$
(vi)	$12xy^2 + 25$	$12xy^2$	$12y^2$
(vii)	$7x + xy^2$	$7x ; xy^2$	$7 ; y^2$

(b)

Row	Expression	Term with y^2	Coefficients of y^2
(i)	$8 - xy^2$	xy^2	$-x$
(ii)	$5y^2 + 7x$	$5y^2$	5
(iii)	$2x^2y - 15xy^2 + 7y^2$	$-15xy^2 ; 7y^2$	$-15 ; 7$

Q.5 Classify into monomials, binomials and trinomials.

(i) $4y - 7z$ (ii) y^2 (iii) $x + y - xy$ (iv) 100 (v) $ab - a - b$
 (vi) $5 - 3t$ (vii) $4p^2q - 4pq^2$ (viii) $7mn$ (ix) $z^2 - 3z + 8$
 (x) $a^2 + b^2$ (xi) $z^2 + z$ (xii) $1 + x + x^2$

Sol: The monomials, binomials, and trinomials have 1, 2, and 3 unlike terms in it respectively.

(i) $4y - 7z$	Binomial
(ii) y^2	Monomial
(iii) $x + y - xy$	Trinomial
(iv) 100	Monomial
(v) $ab - a - b$	Trinomial
(vi) $5 - 3t$	Binomial
(vii) $4p^2q - 4pq^2$	Binomial
(viii) $7mn$	Monomial
(ix) $z^2 - 3z + 8$	Trinomial
(x) $a^2 + b^2$	Binomial
(xi) $z^2 + z$	Binomial
(xii) $1 + x + x^2$	Trinomial

Q.6 State whether a given pair of terms is of like or unlike terms.

- | | | |
|-------------------|--------------------------|-----------------------|
| (i) 1, 100 | (ii) $-7x, \frac{1}{4}x$ | (iii) $-29x, -29y$ |
| (iv) $14xy, 42yx$ | (v) $4m^2p, 4mp^2$ | (vi) $12xz, 12x^2z^2$ |

Sol: The terms which have the same algebraic factors are called like terms. However, when the terms have different algebraic factors, these are called unlike terms.

- | | |
|--------------------------|--------|
| (i) 1, 100 | Like |
| (ii) $-7x, \frac{1}{4}x$ | Like |
| (iii) $-29x, -29y$ | Unlike |
| (iv) $14xy, 42yx$ | Like |
| (v) $4m^2p, 4mp^2$ | Unlike |
| (vi) $12xz, 12x^2z^2$ | Unlike |

Q.7 Identify like terms in the following:

- (a) $-xy^2, -4yx^2, 8x^2, 2xy^2, 7y, -11x^2, -100x, -11yx, 20x^2y, -6x^2, y, 2xy, 3x$
 (b) $10pq, 7p, 8q, -p^2q^2, -7qp, -100q, -23, 12q^2p^2, -5p^2, 41, 2405p, 78qp, 13p^2q, qp^2, 701p^2$

Sol: (a) $-xy^2, 2xy^2$
 $-4yx^2, 20x^2y$
 $8x^2, -11x^2, -6x^2$
 $7y, y$
 $-100x, 3x$
 $-11xy, 2xy$

(b) $10pq, -7qp, 78qp$

$7p, 2405p$

$8q, -100q$

$-p^2q^2, 12p^2q^2$

$-23, 41$

$-5p^2, 701p^2$

$13p^2q, qp^2$

