

CBSE Class –VII Mathematics
NCERT Solutions
Algebraic Expressions (Ex. 12.1)

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

1. Subtraction of z from y .
2. One-half of the sum of numbers x and y .
3. The number z multiplied by itself.
4. One-fourth of the product of numbers p and q .
5. Numbers x and y both squared and added.
6. Number 5 added to three times the product of m and n .
7. Product of numbers y and z subtracted from 10.
8. Sum of numbers a and b subtracted from their product.

Answer: (i) $y - z$

(ii) $\frac{x+y}{2}$

(iii) z^2

(iv) $\frac{pq}{4}$

(v) $x^2 + y^2$

(vi) $3mn + 5$

(vii) $10 - yz$

(viii) $ab - (a + b)$

Question 2.(i) Identify the terms and their factors in the following expressions, show the terms and factors by tree diagram:

(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 the terms and factors in the expressions given below:

(a) $-4x + 5$

(b) $-4x + 5y$

(c) $5y + 3y^2$

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

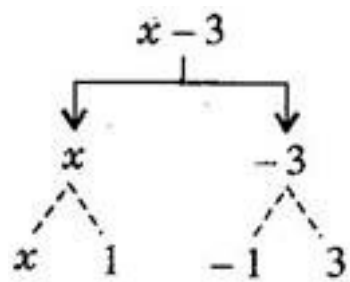
(e) $pq + q$

(f) $1.2ab - 2.4b + 3.6a$

(g) $\frac{3}{4}x + \frac{1}{4}$

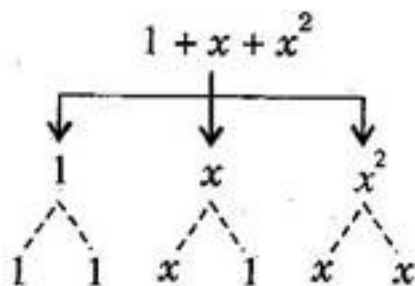
(h) $0.1p^2 + 0.2q^2$

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



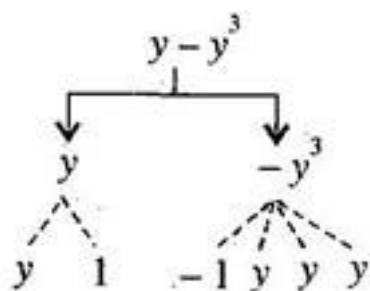
(b) $1 + x + x^2$

Expression



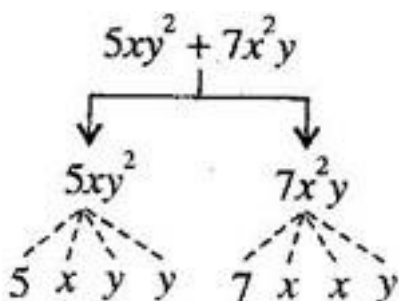
(c) $y - y^3$

Expression



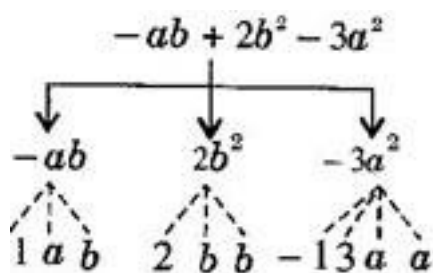
(d) $5xy^2 + 7x^2y$

Expression



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

Expression



(ii) (a) $-4x + 5$

Terms: $-4x, 5$

Factors: $-4, x ; 5$

(b) $-4x + 5y$

Terms: $-4x, 5y$

Factors: $-4, x ; 5, y$

(c) $5y + 3y^2$

Terms: $5y, 3y^2$

Factors: $5, y ; 3, y, y$

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

Terms: $xy, 2x^2y^2$

Factors: $x, y ; 2x, x, y, y$

(e) $pq + q$

Terms: pq, q

Factors: $p, q ; q$

(f) $1.2ab - 2.4b + 3.6a$

Terms: $1.2ab, -2.4b, 3.6a$

Factors: $1.2, a, b ; -2.4, b ; 3.6, a$

(g) $\frac{3}{4}x + \frac{1}{4}$

Terms: $\frac{3}{4}x, \frac{1}{4}$

Factors: $\frac{3}{4}, x ; \frac{1}{4}$

(h) $0.1p^2 + 0.2q^2$

Terms: $0.1p^2, 0.2q^2$

Factors: $0.1, p, p ; 0.2, q, q$

Question 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) $2(l + b)$

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

Answer:

S.No.	Expression	Terms	Numerical Coefficient
(i)	$5 - 3t^2$	$-3t^2$	-3
(ii)	$1 + t + t^2 + t^3$	t	1
		t^2	1
		t^3	1
(iii)	$x + 2xy + 3y$	x	1
		$2xy$	2

		$3y$	3
(iv)	$100m + 1000n$	$100m$	100
		$1000n$	1000
(v)	$-p^2q^2 + 7pq$	$-p^2q^2$	-1
		$7pq$	7
(vi)	$1.2a + 0.8b$	$1.2a$	1.2
		$0.8b$	0.8
(vii)	$3.14r^2$	$3.14r^2$	3.14
(viii)	$2(l + b) = 2l + 2b$	$2l$	2
		$2b$	2
(ix)	$0.1y + 0.01y^2$	$0.1y$	0.1
		$0.01y^2$	0.01

Question 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) $2x^2y - 15xy^2 + 7y^2$

Answer: (a)

S.No.	Expression	Term with factor x	Coefficient 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	1
		xy	y
(vi)	$12xy^2 + 25$	$12xy^2$	$12y^2$
(vii)	$7x + xy^2$	xy^2	y^2
		$7x$	7

(b)

S.No.	Expression	Term contains y^2	Coefficient of y^2
(i)	$8 - xy^2$	$-xy^2$	$-x$
(ii)	$5y^2 + 7x$	$5y^2$	5
(iii)	$2x^2y - 15xy^2 + 7y^2$	$-15xy^2$	$-15x$
		$7y^2$	7

Question 5. Classify into monomials, binomials and trinomials:

(i) $4y - 7x$

(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) $1 + x + x^2$

Answer:

S.No.	Expression	Type of Polynomial
(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

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

(i) 1, 100

(ii) $-7x$, $\frac{5}{2}x$

(iii) $-29x$, $-29y$

- (iv) $14xy, 42yx$
 (v) $4m^2p, 4mp^2$
 (vi) $12xz, 12x^2z^2$

Answer:

S.No.	Pair of terms	Like / Unlike terms
(i)	1, 100	Like terms
(ii)	$-7x, \frac{5}{2}x$	Like terms
(iii)	$-29x, -29y$	Unlike terms
(iv)	$14xy, 42yx$	Like terms
(v)	$4m^2p, 4mp^2$	Unlike terms
(vi)	$12xz, 12x^2z^2$	Unlike terms

Question 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) $10pq, 7p, 8q, -p^2q^2, -7qp, -100q, -23, 12q^2p^2, -5p^2, 41, 2405p, 78qp, 13p^2q, qp^2, 701p^2$

Answer: (a) Like terms are:

- (i) $-xy^2, 2xy^2$
 (ii) $-4yx^2, 20x^2y$
 (iii) $8x^2, -11x^2, -6x^2$
 (iv) $7y, y$
 (v) $-100x, 3x$
 (vi) $-11yx, 2xy$

(b) Like terms are:

- (i) $10pq, -7pq, 78pq$
 (ii) $7p, 2405p$
 (iii) $8q, -100q$
 (iv) $-p^2q^2, 12p^2q^2$
 (v) $-12, 41$
 (vi) $-5p^2, 701p^2$
 (vii) $13p^2q, qp^2$