Access answers to Maths NCERT Solutions for Class 7 Chapter 12 – Algebraic Expressions Exercise 12.1

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

(i) Subtraction of z from y.

Solution:-

= Y – z

(ii) One-half of the sum of numbers x and y.

Solution:-

= ½ (x + y)

= (x + y)/2

(iii) The number z multiplied by itself.

Solution:-

= z × z

= z^2

(iv) One-fourth of the product of numbers p and q.

Solution:-

= ¼ (p × q)

= pq/4

(v) Numbers x and y both squared and added.

Solution:-

= $x^2 + y^2$

(vi) Number 5 added to three times the product of numbers m and n.

Solution:-

= 3mn + 5

(vii) Product of numbers y and z subtracted from 10.

Solution:-

= 10 – (y × z)

= 10 – yz

(viii) Sum of numbers a and b subtracted from their product.

Solution:-

= (a × b) – (a + b)

= ab – (a + b)

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

Show the terms and factors by tree diagrams.

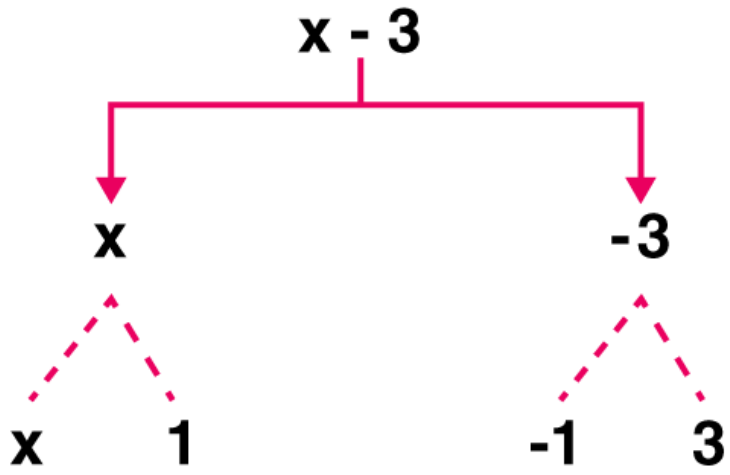
(a) x – 3

Solution:-

Expression: x – 3

Terms: x, -3

Factors: x; -3



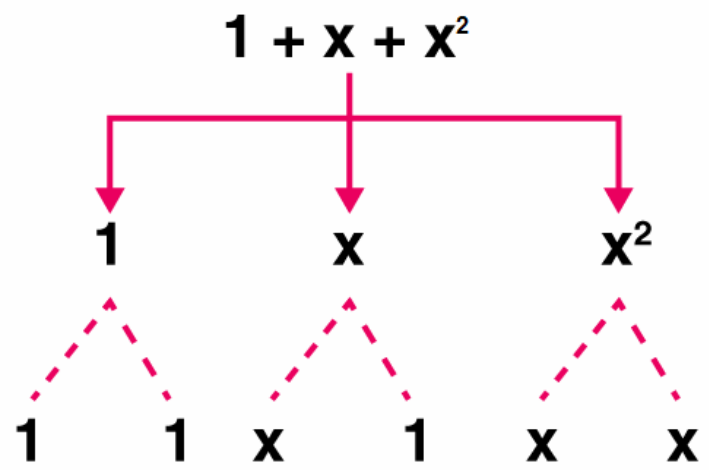
(b) $1 + x + x^2$

Solution:-

Expression: $1 + x + x^2$

Terms: $1, x, x^2$

Factors: 1; x; x,x



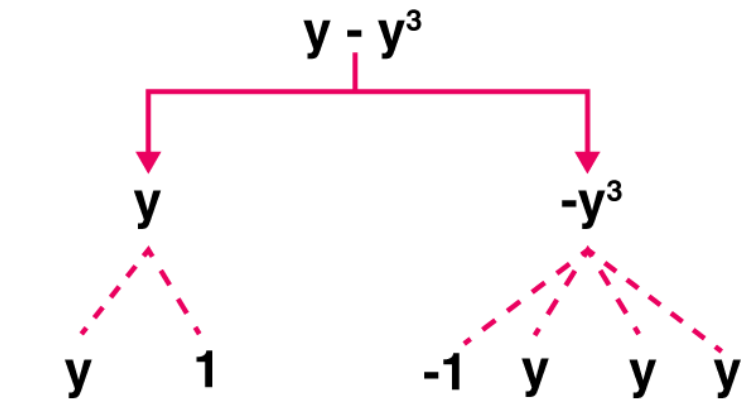
(c) $y – y^3$

Solution:-

Expression: $y – y^3$

Terms: $y, -y^3$

Factors: y; -y, -y, -y



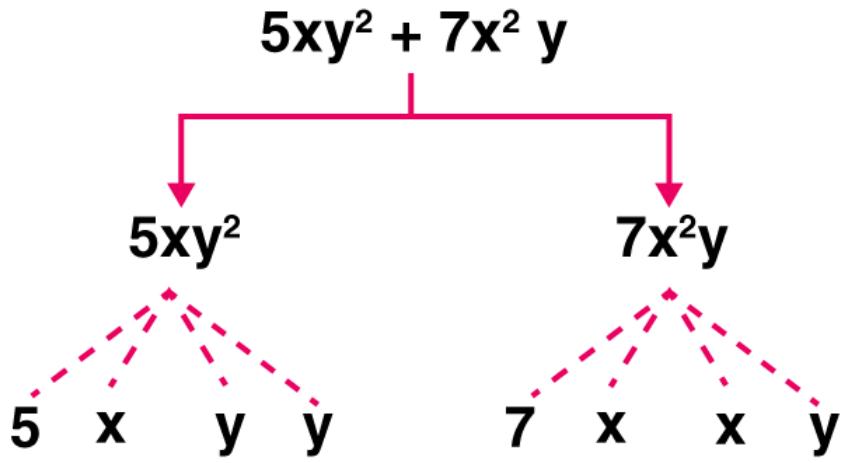
(d) $5xy^2 + 7x^2y$

Solution:-

Expression: $5xy^2 + 7x^2y$

Terms: $5xy^2$, $7x^2y$

Factors: 5, x, y, y; 7, x, x, y



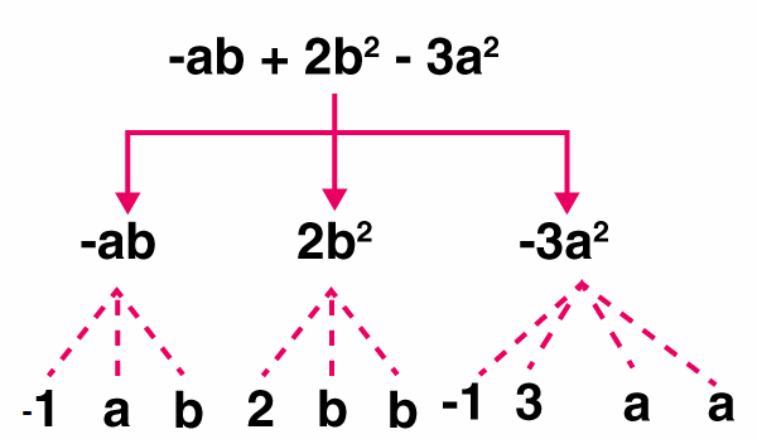
(e) $-ab + 2b^2 - 3a^2$

Solution:-

Expression: $-ab + 2b^2 - 3a^2$

Terms: $-ab$, $2b^2$, $-3a^2$

Factors: -a, b; 2, b, b; -3, a, a



(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) 1.2 ab – 2.4 b + 3.6 a (g) ¾ x + ¼

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

Solution:-

Expressions is defined as, numbers, symbols and operators (such as +. – , × and ÷) grouped together that show the value of something.

In algebra a term is either a single number or variable, or numbers and variables multiplied together. Terms are separated by + or – signs or sometimes by division.

Factors is defined as, numbers we can multiply together to get another number.

Sl.No.	Expression	Terms	Factors
(a)	– 4x + 5	-4x 5	-4, x 5
(b)	– 4x + 5y	-4x 5y	-4, x 5, y
(c)	5y + $3y^2$	5y $3y^2$	5, y 3, y, y
(d)	xy + $2x^2y^2$	xy $2x^2y^2$	x, y 2, x, x, y, y
(e)	pq + q	pq q	P, q Q
(f)	1.2 ab – 2.4 b + 3.6 a	1.2ab -2.4b 3.6a	1.2, a, b -2.4, b 3.6, a
(g)	¾ x + ¼	¾ x ¼	¾, x ¼
(h)	0.1 p^2 + 0.2 q^2	0.1p^2 0.2q^2	0.1, p, p 0.2, 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) $1.2\ a + 0.8\ b$ (vii) $3.14\ r^2$ (viii) $2\ (l + b)$

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

Solution:-

Expressions is defined as, numbers, symbols and operators (such as +. – , × and ÷) grouped together that show the value of something.

In algebra a term is either a single number or variable, or numbers and variables multiplied together. Terms are separated by + or – signs or sometimes by division.

A coefficient is a number used to multiply a variable (2x means 2 times x, so 2 is a coefficient) Variables on their own (without a number next to them) actually have a coefficient of 1 (x is really 1x)

Sl.No.	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)	$1.2\ a + 0.8\ b$	$1.2a$ $0.8b$	1.2 0.8
(vii)	$3.14\ r^2$	3.14^2	3.14
(viii)	$2\ (l + b)$	$2l$ $2b$	2 2
(ix)	$0.1\ y + 0.01\ y^2$	$0.1y$ $0.01y^2$	0.1 0.01

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) $7x + xy^2$

Solution:-

Sl.No.	Expression	Terms	Coefficient of x

(i)	$y^2x + y$	y^2x	y^2
(ii)	$13y^2 – 8yx$	$– 8yx$	$-8y$
(iii)	$x + y + 2$	x	1
(iv)	$5 + z + zx$	x zx	1 z
(v)	$1 + x + xy$	xy	y
(vi)	$12xy^2 + 25$	$12xy^2$	$12y^2$
(vii)	$7x + xy^2$	$7x$ xy^2	7 y^2

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

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

Solution:-

Sl.No.	Expression	Terms	Coefficient of x
(i)	$8 – xy^2$	$– xy^2$	$– x$
(ii)	$5y^2 + 7x$	$5y^2$	5
(iii)	$2x^2y – 15xy^2 + 7y^2$	$– 15xy^2$ $7y^2$	$– 15x$ 7

5. Classify into monomials, binomials and trinomials.

(i) 4y – 7z

Solution:-

Binomial.

An expression which contains two unlike terms is called a binomial.

(ii) y^2

Solution:-

Monomial.

An expression with only one term is called a monomial.

(iii) x + y – xy

Solution:-

Trinomial.

An expression which contains three terms is called a trinomial.

(iv) 100

Solution:-

Monomial.

An expression with only one term is called a monomial.

(v) ab – a – b

Solution:-

Trinomial.

An expression which contains three terms is called a trinomial.

(vi) 5 – 3t

Solution:-

Binomial.

An expression which contains two unlike terms is called a binomial.

(vii) $4p^2q – 4pq^2$

Solution:-

Binomial.

An expression which contains two unlike terms is called a binomial.

(viii) 7mn

Solution:-

Monomial.

An expression with only one term is called a monomial.

(ix) $z^2 – 3z + 8$

Solution:-

Trinomial.

An expression which contains three terms is called a trinomial.

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

Solution:-

Binomial.

An expression which contains two unlike terms is called a binomial.

(xi) $z^2 + z$

Solution:-

Binomial.

An expression which contains two unlike terms is called a binomial.

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

Solution:-

Trinomial.

An expression which contains three terms is called a trinomial.

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

(i) 1, 100

Solution:-

Like term.

When term have the same algebraic factors, they are like terms.

(ii) –7x, (5/2)x

Solution:-

Like term.
When term have the same algebraic factors, they are like terms.

(iii) – 29x, – 29y
Solution:-
Unlike terms.
The terms have different algebraic factors, they are unlike terms.
(iv) 14xy, 42yx
Solution:-
Like term.
When term have the same algebraic factors, they are like terms.

(v) $4m^2p$, $4mp^2$
Solution:-
Unlike terms.
The terms have different algebraic factors, they are unlike terms.
(vi) $12xz$, $12x^2z^2$
Solution:-
Unlike terms.
The terms have different algebraic factors, they are unlike terms.
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, $2xy$, $3x$
Solution:-
When term have the same algebraic factors, they are like terms.
They are,
$-xy^2$, $2xy^2$
$-4yx^2$, $20x^2y$
$8x^2$, $-11x^2$, $-6x^2$
$7y$, y
$-100x$, $3x$
$-11yx$, $2xy$
(b) $10pq$, $7p$, $8q$, $-p^2q^2$, $-7qp$, $-100q$, -23, $12q^2p^2$, $-5p^2$, 41, $2405p$, $78qp$, $13p^2q$, qp^2, $701p^2$
Solution:-
When term have the same algebraic factors, they are like terms.
They are,
$10pq$, $-7qp$, $78qp$
$7p$, $2405p$
$8q$, $-100q$
$-p^2q^2$, $12q^2p^2$

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– $5p^2$, $701p^2$

$13p^2q$, qp^2