Board – CBSE	Class – 7th	Topic – Algebraic Expressions 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) $5xy^2 + 7x^2y$

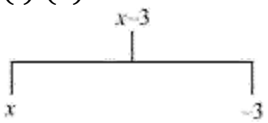
(e) $-ab + 2b^2 - 3a^2$

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

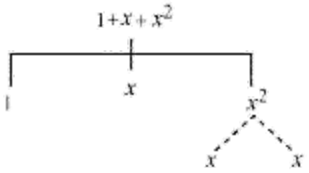
(a) $-4x + 5$ (b) $-4x + 5y$ (c) $5y + 3y^2$ (d) $xy + 2x^2y^2$

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

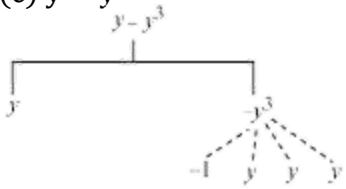
Sol: (i) (a) $x - 3$



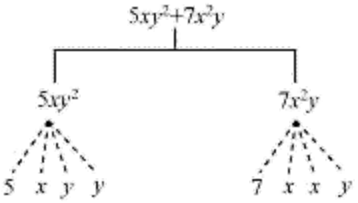
(b) $1 + x + x^2$



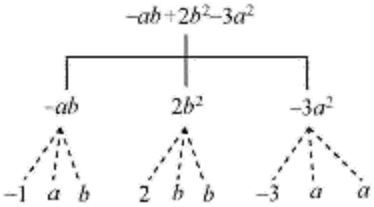
(c) $y - y^3$



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



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



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)	$1.2\ ab - 2.4\ b + 3.6\ a$	$1.2\ ab$, $2.4\ b$, $3.6\ a$	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)	$0.1p^2 + 0.2\ q^2$	$0.1p^2$, $0.2\ q^2$	0.1, p, p ; 0.2, q, q

(ii)

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) $3.14\ r^2$ (viii) $2\ (l + b)$

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

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)	$2\ (l + b) = 2l + 2b$	$2l\ ,\ 2b$	2, 2
(ix)	$0.1y + 0.01\ y^2$	$0.1y\ ,\ 0.01\ y^2$	0.1 , 0.01

So

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 y2 and give the coefficient of y^2.

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

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)	$7x + xy^2$	$7x ; xy^2$	$7 ; y^2$

Sol: (a)

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

(b)

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) $12xz, 12\ x^2z^2$

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) $12xz, 12\ x^2z^2$ 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) $10pq, -7qp, 78qp$

$7p, 2405p$

$8q, -100q$

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

$-23, 41$

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

$13p^2q, qp^2$