Exercise 12.1

Question 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 m and n.

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

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

Answer 1:

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

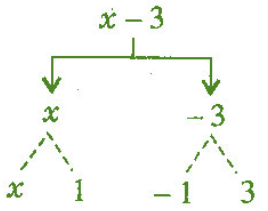
Answer 2:

(i) (a) $x-3$

Expression

Terms

Factors

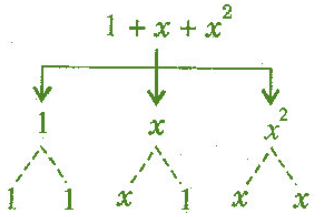


(b) $1+x+x^2$

Expression

Terms

Factors

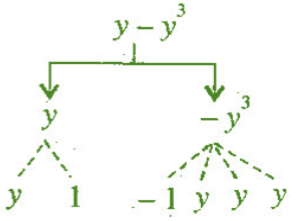


(c) $y-y^3$

Expression

Terms

Factors

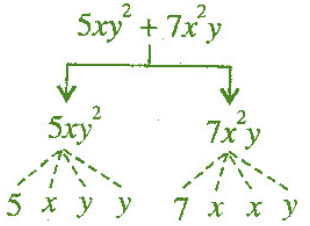


(d) $5xy^2+7x^2y$

Expression

Terms

Factors

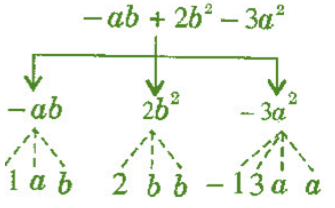


(e) $-ab+2b^2-3a^2$

Expression

Terms

Factors



(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 3:

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 4:

(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 5:

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 6:

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 7:

(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) $13p^2q, qp^2$