VIII Homework – 31

1) Identify in the following expressions, terms which are not constants. Give their numerical coefficients:
$xy+4$; $13-y^2$; $13-y+5y^2$, $4p^2q-3pq^2+5$

ans:-

expression	terms	numerical coefficients
$xy+4$	xy	1
$13-y^2$	$-y^2$	-1
$13-y+5y^2$	$-y, 5y^2$	$-1, 5$
$4p^2q-3pq^2+5$	$4p^2q, -3pq^2$	$4, -3$

2) (a) What are the coefficients of x in the following expressions? $4x-3y$, $8-x+y$, y^2x-y, $2z-5xz$

ans:-

expression	coefficient of x
$4x-3y$	4
$8-x+y$	-1
y^2x-y	y^2
$2z-5xz$	$-5z$

(b) What are the coefficients of y in the following expression
$4x-3y$, $8+yz$, yz^2+5, $my+m$

ans:-

expression	coefficient of y
$4x-3y$	-3
$8+yz$	z
yz^2+5	z^2
$my+m$	m

3) Classify the following expressions as a monomial, a binomial or a trinomial:
a, $a+b$, $ab+a+b$, $a+b-5$, xy, $xy+5$, $5x^2-x+2$, $4pq-3q+5p$, 7, $4m-7n+10$, $4mn+7$

ans:-

monomial	binomial	trinomial
a	$a+b$	$ab+a+b$
xy	$xy+5$	$a+b-5$
7	$4mn+7$	$5x^2-x+2$
		$4pq-3q+5p$
		$4m-7n+10$

4) Collect like terms and simplify the expression:
$12m^2 - 9m + 5m - 4m^2 - 7m + 10$

ans:- $(12m^2 - 4m^2) + (5m - 9m - 7m) + 10$
$= 8m^2 - 11m + 10$

5) Add and Subtract
(i) $m - n, m + n$

ans:- On adding:- $m - n + m + n = 2m$
On Subtracting:- $m - n - m - n = -2n$
(ii) $mn + 5 - 2, mn + 3$

ans:- On adding:- $mn + 5 - 2 + mn + 3 = (mn + mn) + (5 - 2 + 3)$
$= 2mn + 6$
On Subtracting:- $mn + 5 - 2 - mn - 3 = 3 - 3 = 0$

6) Subtract $24ab - 10b - 18a$ from $30ab + 12b + 14a$

ans:- $(30ab + 12b + 14a) - (24ab - 10b - 18a)$
$= 30ab + 12b + 14a - 24ab + 10b + 18a$
$= (30ab - 24ab) + (12b + 10b) + (14a + 18a)$
$= 6ab + 22b + 32a$

7) From the sum of $2y^2 + 3yz$; $-y^2 - yz - z^2$ and $yz + 2z^2$, subtract the sum of $3y^2 - z^2$ and $-y^2 + yz + z^2$.

ans:- * $2y^2 + 3yz - y^2 - yz - z^2 + yz + 2z^2$

$3yz + 2y^2 - y^2 - z^2 + 2z^2 = y^2 + z^2 + 3yz$

* $3y^2 - z^2 - y^2 + yz + z^2 = 2y^2 + yz$

$\therefore y^2 + z^2 + 3yz - 2y^2 - yz = -y^2 + z^2 + 2yz$

8) Classify the following polynomials as monomials, binomials, trinomials: $-z + 5$; $x + y + z$; $y + z + 100$; $ab - ac$; 17

ans:-

monomial	binomial	trinomial
17	$-z + 5$	$x + y + z$
	$ab - ac$	$y + z + 100$

9) Add: $7xy + 5yz - 3zx$; $4yz + 9zx - 4y$; $-3xz + 5x - 2xy$

$7xy + 5yz - 3zx$
$0xy + 4yz + 9zx - 4y$
$(+)\ -2xy + 0yz - 3zx + 0y + 5x$

$5xy + 9yz + 3zx - 4y + 5x$ //

10) Add:

(i) $t - 8tz$; $3tz - z$; $z - t$

ans:-

$t - 8tz$
$0t + 3tz - z$
$(+)\ -t + 0tz + z$

$0 - 5tz + 0 = -5tz$ //

(ii) $7mn + 5$; $12mn + 2$; $9mn - 8$; $-2mn - 3$

ans:- $(7mn + 12mn + 9mn - 2mn) + (5 + 2 - 8 - 3)$

$= 26mn - 4$ //

(iii) $a + b - 3$; $b - a + 3$; $a - b + 3$

ans:- $(a - a + a) + (b + b - b) + (-3 + 3 + 3)$

$= a + b + 3$ //

(iv) $14x + 10y - 12xy - 13$; $18 - 7x - 10y + 8xy$; $4xy$

ans:- $(14x - 7x) + (10y - 10y) + (-12xy + 8xy + 4xy) + (-13 + 18)$

$= 7x + -4xy + 4xy + 5 = 7x + 5$ //

(v) $5m - 7n$; $3n - 4m + 2$; $2m - 3mn - 5$

ans:- $(5m - 4m + 2m) + (-7n + 3n) + (2 - 5) - 3mn$

$= 3m - 4n - 3 - 3mn$ //

11) Subtract $5x^2 - 4y^2 + 6y - 3$ from $7x^2 - 4xy + 8y^2 + 5x - 3y$

ans:- $(7x^2 - 4xy + 8y^2 + 5x - 3y) - (5x^2 - 4y^2 + 6y - 3)$

$= 7x^2 - 4xy + 8y^2 + 5x - 3y - 5x^2 + 4y^2 - 6y + 3$

$= (7x^2 - 5x^2) + (8y^2 + 4y^2) + (-3y - 6y) - 4xy + 5x + 3$

$= 2x^2 + 12y^2 - 9y - 4xy + 5x + 3$ //

12) Subtract $4a - 7ab + 3b + 12$ from $12a - 9ab + 5b - 3$

ans:- $(12a - 9ab + 5b - 3) - (4a - 7ab + 3b + 12)$

$= 12a - 9ab + 5b - 3 - 4a + 7ab - 3b - 12$

$= (12a - 4a) + (5b - 3b) + (-9ab + 7ab) + (3 - 12)$

$= 8a + 2b - 2ab - 15$

13) Subtract $3xy + 5yz - 7zx$ from $5xy - 2yz - 2zx + 10xyz$

ans:- $(5xy - 2yz - 2zx + 10xyz) - (3xy + 5yz - 7zx)$

$$\begin{array}{r} 5xy - 2yz - 2zx + 10xyz \\ (+)\ \overset{(-)}{-}3xy \overset{(-)}{-}5yz \overset{(+)}{+}7zx \\ \hline 2xy - 7yz + 5zx + 10xyz \end{array}$$

14) Subtract $4p^2q - 3pq + 5pq^2 - 8p + 7q - 10$ from $18 - 3p - 11q + 5pq - 2pq^2 + 5p^2q$

ans:- $(18 - 3p - 11q + 5pq - 2pq^2 + 5p^2q) - (4p^2q - 3pq + 5pq^2 - 8p + 7q - 10)$

$$\begin{array}{r} 18 - 3p - 11q + 5pq - 2pq^2 + 5p^2q \\ (+)\ \overset{(+)}{-}10 \overset{(+)}{-}8p \overset{(-)}{+}7q \overset{(+)}{-}3pq \overset{(-)}{+}5pq^2 \overset{(-)}{-}4p^2q \\ \hline 28 + 5p - 18q + 8pq - 7pq^2 + p^2q \end{array}$$

15) (a) What should be added to $x^2 + xy + y^2$ to obtain $2x^2 + 3xy$?

ans:- Let the expression to be added be X.

Then, $x^2 + xy + y^2 + X = 2x^2 + 3xy$

$\therefore X = 2x^2 + 3xy - x^2 - xy - y^2$

$= (2x^2 - x^2) + (3xy - xy) - y^2$

$= x^2 + 2xy - y^2$

(b) What should be subtracted from $2a + 8b + 10$ to get $-3a + 7b + 16$? Let the expression to be subtracted be X

ans:- $(2a + 8b + 10) - X = -3a + 7b + 16$

$2a + 8b + 10 + 3a - 7b - 16 = X$

$\therefore X = (2a + 3a) + (8b - 7b) + (10 - 16)$

$= 5a + b - 6$

16) What should be taken away from $3x^2 - 4y^2 + 5xy + 20$ to obtain $-x^2 - y^2 + 6xy + 20$?

ans:- Let the expression to be subtracted be X.

Then, $3x^2 - 4y^2 + 5xy + 20 - X = -x^2 - y^2 + 6xy + 20$

$\Rightarrow 3x^2 - 4y^2 + 5xy + \cancel{20} + x^2 + y^2 - 6xy - \cancel{20} = X$

$\therefore X = (3x^2 + x^2) + (-4y^2 + y^2) + (5xy - 6xy)$

$= 4x^2 - 3y^2 - xy$

17) (a) From the sum of $3x-y+11$ and $-y-11$, subtract $3x-y-11$

ans:- * $(3x-y+11)+(-y-11) = 3x-y-y+11-11$
$= 3x-2y$

Then, $(3x-2y)-(3x-y-11)$
$= 3x-2y-3x+y+11$
$= -y+11$ //

(b) From the sum of $4+3x$ and $5-4x+2x^2$, subtract the sum of $3x^2-5x$ and $-x^2+2x+5$.

ans:- * $4+3x+5-4x+2x^2 = 2x^2+(3x-4x)+(4+5)$
$= 2x^2-x+9$

* $3x^2-5x-x^2+2x+5 = (3x^2-x^2)+(-5x+2x)+5$
$= 2x^2-3x+5$

Then, $(2x^2-x+9)-(2x^2-3x+5)$
$= 2x^2-x+9-2x^2+3x-5$
$= 2x+4$ //

18) What should be the value of a if the value of $2x^2+x+a$ equals to 5, when $x=0$?

ans:- $2x^2+x+a = 5$
when $x=0$, $0+0+a = 5$
$\therefore a = 5$ //

19) Simplify the expression and find its value when $a=5$ and $b=-3$.
$2(a^2+ab)+3-ab$

ans:- $2(a^2+ab)+3-ab = 2a^2+2ab+3-ab$
$= 2a^2+ab+3$

when $a=5, b=-3$
$2a^2+ab+3 = 2(5)^2+5\times(-3)+3$
$= 2\times25-15+3$
$= 50-12 = 38$ //

20) If $p = -10$, find the value of $p^2 - 2p - 100$

ans:- when $p = -10$, $(-10)^2 - 2(-10) - 100$

$= 100 + 20 - 100 = 20$