EXERCISE 11A

Question 1. Separate the constants and variables from the following:

$-7, 7+x, 7x+yz, \sqrt{5}, \sqrt{xy}, \frac{3yz}{8}, 4.5y-3x\ 8-5, 8-5x, 8x-5y\times p$ and $3y^2z \div 4x$

Solution:-

Clearly constants are: $-7, \sqrt{5}, 8-5$

Variable are: $7+x, 7x+yz, \sqrt{xy}, \frac{3yz}{8}, 4.5y-3x, 8-5x, 8x-5y\times p$ and $3y^2z \div 4x$

Question 2.

Write the number of terms in each of the following polynomials.

(i) $5x^2 + 3\times ax$

(ii) $ax \div 4 - 7$

(iii) $ax - by + y\times z$

(iv) $23 + a \times b \div 2$

Solution:-

(i) $5x^2 + 3xax$

$5x^2 + 3 \times ax = 5x^2 + 3ax$

∴ The number of terms in this Polynomial =2

(ii) $ax \div 4 - 7 = \frac{ax}{4} - 7$

∴ The number of terms in this polynomial =2

(iii) $ax - by + y \times z = ax - by + yz$

∴ The number of terms in this polynomial =3

(iv) $23 + a \times b \div 2 = 23 + \frac{ab}{2}$

∴ The number of terms in this polynomial =2

Question 3.

Separate monomials, binomials, trinomials and polynomials from the following algebraic expressions:

$8-3x, xy^2, 3y^2 - 5y + 8, 9x - 3x^2 + 15x^3 - 7$
$3x \times 5y, 3x \div 5y, 2y \div 7 + 3x - 7$ and $4 - ax^2 + bx + y$

Solution:-

Monomials are: $xy^2, 3x \times 5y, 3x \div 5y$

Binomials are: 8-3 x

Trinomials are: $3y^2 - 5y + 8, 2y \div 7 + 3x - 7$

Polynomials are: $8 - 3x, 3y^2 - 5y + 8, 9x - 3x^2 + 15x^3 - 7, 2y \div 7 + 3x - 7, 4 - ax^2 + bx + y$

Question 4.

Write the degree of each polynomial given below:

(i) x y+7 z

Solution:-

degree=2(Polynomial is xy+7z)

(ii) $x^2 - 6x^3 + 8y$

Solution:-

Degree=3(Polynomial is $x^2 - 6x^3 + 8y$)

(iii) $y - 6y^2 + 5y^8$

Solution:-

Degree= 8 (Polynomial is $y - 6y^2 + 5y^8$)

(iv) x y z-3

Solution:-

Degree=3 (Polynomial is xyz-3)

(v) $xy + yz^2 - zx^3$

Solution:-

Degree= 4 (Polynomial is $xy + yz^2 - xz^3$)

(vi) $x^5y^7 - 8x^3y^8 + 10x^4y^4z^4$

Degree= 12 (Polynomial is $x^5y^7 - 8x^3y^8 + 10x^4, y^4z^4$)

Question 5.

Write the coefficient of:

(i) ab in 7abx

Solution:-

The coefficient of ab in 7 a b x=7 x

(ii) 7a in 7abx

Solution:-

The coefficient of ab 7a in 7abx=bx

(iii) $5x^2$ in $5x^2 - 5x$

Solution:-

The coefficient of $5x^2$ in $5x^2 - 5x = 1$

(iv) 8 in $a^2 - 8ax + a$

Solution:-

The coefficient of 8 in $a^2 - 8ax + a = -ax$

(v) $4xy$ in $x^2 - 4xy + y^2$

Solution:-

The coefficient of $4xy$ in $x^2 - 4xy + y^2 = -1$

Question 6:

$\ln \frac{5}{7}xy^2z^3$. Write the coefficient of

(i) 5

Solution:-

5 is $\frac{1}{7}xy^2z^3$

(ii) $\frac{5}{7}$

Solution:-

$\frac{5}{7}$ is xy^2z^3

(iii) 5 x

$5x$ is $\frac{1}{7}y^2z^3$

(iv) xy^2

Solution:-

xy^2 is $\frac{5}{7}z^3$

(v) z^3

Solution:-

z^3 is $\frac{5}{7}xy^2$

(vi) xz^3

Solution:-

xz^3 is $\frac{5}{7}y^2$

(vii) $5xy^2$

Solution:-

$5xy^2$ is $\frac{1}{7}z^3$

(viii) $\frac{1}{7}yz$

Solution:-

$\frac{1}{7}yz \text{is} 5xyz^2$

(ix) z

Solution:-

z is $\frac{5}{7}xy^2z^2$

(x) yz^2

Solution:-

yz^2 is $\frac{5}{7}xy - z$

(xi) 5 xyz

Solution:-

$5xyz$ is $\frac{1}{7}yz^2$

Question 7.

In each polynomial, given below, separate the like terms:

(i) $3xy, -4yx^2, 2xy^2, 2.5x^2y, -8yx, -3.2y^2x$ and x^2y

Solution:-

(i) Like terms are

$3xy, -8yx; -4yx^2, 2.5x^2y$ and $x^2y; 2xy^2$ and $-3.2y^2$
(ii) $y^2z^3, xy^2z^3, -5x^2yz, -4y^2z^3, -8xz^3y^2, 3x^2yz$ and $2z^3y^2$

Solution:-

$y^2z^3, -y^2z^3$ and $2z^3y^2; xy^2z^3$ and $-8xz^3y - 5x^2yz$ and $: x^2yz$

Exercise 11B

Question 1

Evaluate:

(i) $-7x^2 + 18x^2 + 3x^2 - 5x^2$

Solution:-

$= 21x^2 - 12x^2 = 9x^2$

(ii) $b^2y - 9b^2y + 2b^2y - 5b^2$

Solution:-

$= 3b^2y - 14b^2y = -11b^2y$

(iii) abx-15abx-10abx+32abx

Solution:-

=33abx-25abx

=8abx

(iv) 7x-9y+3-3x-5y+8

Solution:-

=7x-3x-9y-5y+3+8

=4x-14y+11

(v) $3x^2 + 5xy - 4y^2 + x^2 - 8xy - 5y^2$

Solution:-

$= 3x^2 + 5xy - 8xy - 4y^2 - 5y^2 = 3x^2 - 3xy - 9y^2$

Question 2

Add :

(i) 5a+3y . a-2b,3a+5b

Solution:-

$$\begin{array}{r} 5a + 3b \\ a - 2b \\ 3a + 5b \\ \hline 9a + 6b \\ \hline \end{array}$$

(ii)8x-3y+7z,-4x+5y-4z,-x-y-2z

Solution:

$$\begin{array}{r} 8x - 3y + 7z \\ -4x + 5y - 4z \\ -x - y - 2z \\ \hline 3x + y + z \\ \hline \end{array}$$

(iii)3b-7c+10,5c-2b-15,15+12c+b

Solution:-

$$\begin{array}{r} 3b - 7c + 10 \\ -2b + 5c - 15 \\ +b + 12c + 15 \\ \hline 2b + 10c + 10 \\ \hline \end{array}$$

(iv) a-3b+3;2a+5-3c:6c-15+6b

Solution:-

$$\begin{array}{r} a-3b \quad +3 \\ 2a \quad -3c \quad +5 \\ +6b \ +6c \ -15 \\ \hline 3a \ +3b \ +3c \ - \ 7 \\ \hline \end{array}$$

(v)13ab-9cd-xy;5xy;15cd-7ab 6xy-3cd

Solution:

$$\begin{array}{r} 13ab - 9cd + xy \\ +5xy \\ -7ab + 15cd \\ -3cd+6xy \\ \hline 6ab+3cd+10xy \\ \hline \end{array}$$

(vi) $x^3 - x^2y + 5xy^2 + y^3; -x^3 - 9xy^2 + y^3; 3x^2y + 9xy^2$

Solution:

$$\begin{array}{r} x^3 - x^2y + 5xy^2 + y^3 \\ -x^3 - 9xy^2 + y^3 \\ \hline +3x^2y + 9xy^2 \\ \hline 2x^2y + 5xy^2 + 2y^3 \\ \hline \end{array}$$

(vii) $a^6 - 4a^4 + 6a$;
$5a^6 + 5a^4 + 6a$;
$12a^6 - 10a$

Solution:-

$$\begin{array}{r} a^6 - 4a^4 + 6a \\ 5a^6 + 5a^4 + 6a \\ 12a^6 - 10a \\ \hline 18a^6 + a^4 + 2a \\ \hline \end{array}$$

(viii) $2ax - 6by + 4cz$;
$4by - 14ax$;
$9cz - 4ax - 6by$

Solution:-

$$\begin{array}{r} 2ax - 6by + 4cz \\ 4by - 14ax \\ 9cz - 4ax - 6by \\ \hline -16ax - 8by + 13cz \\ \hline \end{array}$$

Question 3

Find the total savings of a boy who saves £ (4x-6y); £ (6x+2y); £ (4y-x)and £ (y-2x)for four consecutive weeks.

Solution:-

$$4x - 6y$$

$$6x + 2y$$

$$-x + 4y$$

$$-2x + y$$

$$7x + y$$

∴Total savings= (7x+y)

Question 4.

Subtract:

(i) $4xy^2$ from $3xy^2$

Solution:-

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

(ii) $-2x^2y + 3xy^2$ from $8x^2y$

Solution:-

$$\begin{array}{r} 8x^2y \\ -2x^2y + 3xy^2 \\ \hline + \quad - \\ \hline 10x^2y \quad 3xy^2 \end{array}$$

(iii) 3a-5b+c+2d from 7a-3b+c-2d

Solution:-

$$\begin{array}{r} 7a - 3b + c - 2d \\ 3a - 5b + c + 2d \\ \hline - \quad + \quad - \quad - \\ \hline 4a + 2b \quad - 4d \end{array}$$

(iv) $x^3 - 4x - 1$ from $3x^3 - x^2 + 6$

Solution:-

$$\begin{array}{r} 3x^3 - x^2 + 6 \\ x^3 - 4x - 1 \\ + \\ \hline 2x^3 - x^2 + 4x + 7 \\ \hline \end{array}$$

(v) $6a + 3$ from $a^3 - 3a^2 + 4a + 1$

Solution:-

$$\begin{array}{r} a^3 - 3a^2 + 4a + 1 \\ + 6a + 3 \\ - \quad - \\ \hline a^3 - 3a^2 - 2a - 2 \\ \hline \end{array}$$

(vi) cab-4cad-cbd from 3abc+5bcd-cda

Solution:-

$$\begin{array}{r} 3abc + 5bcd - cda \\ +cab - cbd - 4cad \\ - \\ \hline 2abc + 6bcd + 3cad \\ \hline \end{array}$$

(vii) $a^2 + ab + b^2$ from $4a^2 - 3ab + 2b^2$

Solution:-

$$\begin{array}{r} 4a^2 - 3ab + 2b^2 \\ +a^2 + ab + b^2 \\ - \\ \hline 3a^2 - 4ab + b^2 \\ \hline \end{array}$$

Question 5.

(i) Take a $3x^3 + 4x^2 - 5x + 6$ from $3x - 4x^2 + 5x - 6)$

Solution:-

$$3x^3 - 4x^2 + 5x - 6$$

$$-3x^3 + 4x^2 - 5x + 6$$

$$+ \quad - \quad + \quad -$$

$$6x^3 - 8x^2 + 10x - 12$$

(ii)Take $m^2 + m + 4$ from $-m^2 + 3m + 6 and the result from m^2 + m + 1$

Solution:-

$$-m^2 + 3m + 6$$
$$\pm m^2 \pm m \pm 4$$
$$-2m^2 + 2m + 2$$

$$-m^2 + m + 1$$
$$-2m^2 + 2m + 2$$
$$+ \quad - \quad -$$
$$3m^2 - m - 1$$

Question 6.

Subtract the sum of $5y^2 + y - 3$ and $y^2 - 3y + 7$ from $6y^2 + y - 2$

Solution:-

$$5y^2 + y - 3$$
$$y^2 - 3y + 7$$
$$6y^2 - 2y + 4$$

$$6y^2 + y - 2$$
$$6y^2 - 2y + 4$$
$$- \quad +$$
$$3y - 6$$

Question: 7

What must be added $x^4 - x^3 + x^2 + x + 3$ to obtain $x^4 + x^2 - 1$?

Solution:-

$$\begin{array}{r} x^4 \quad + x^2 \\ +x^4 - x^3 + x^2 + x + 3 \\ \hline -+ \quad 1- \\ \hline x^3 \quad x-4 \\ \hline \end{array}$$

Question: 8

(i) How much more than $2x^2 + 4xy + 2y^2$ is $5x^2 + 10xy - y^2$?

Solution:-

$$\begin{array}{r} 5x^2 + 10xy - y^2 \\ +2x^2 + 4xy + 2y^2 \\ \hline 3x^2 - 6xy - 3y^2 \\ \hline \end{array}$$

(ii) How much less $2a^2 + 1$ is than $3a^2 - 6$?

Solution:-

$$\begin{array}{r} 3a^2 \quad - \quad 6 \\ 2a^2 + \quad 1 \\ \hline a^2 - \quad 7 \\ \hline \end{array}$$