

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) $ax - by + yxz$

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

Solution:-

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

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

\therefore The number of terms in this Polynomial = 2

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

\therefore The number of terms in this polynomial = 2

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

\therefore The number of terms in this polynomial = 3

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

\therefore 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: $8-3x$

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) $xy + 7z$

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) $xy - z - 3$

Solution:-

Degree=3 (Polynomial is $xyz - 3$)

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

Solution:-

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

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

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

Question 5.

Write the coefficient of:

(i) ab in $7abx$

Solution:-

The coefficient of ab in $7abx = 7x$

(ii) $7a$ in $7abx$

Solution:-

The coefficient of ab 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:

In $\frac{5}{7}xy^2z^3$. 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) $5x$

$5x$ 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:-

$\frac{1}{7}yz$ 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) $5xyz$

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 $-3.2y^2x$

(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) $5a + 3b$. $a - 2b$, $3a + 5b$

Solution:-

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

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

Solution:

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

(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:-

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

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

Solution:

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

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

Solution:

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

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

Solution:-

$$a^6 - 4a^4 + 6a$$

$$5a^6 + 5a^4 + 6a$$

$$12a^6 - 10a$$

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

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

Solution:-

$$2ax - 6by + 4cz$$

$$4by - 14ax$$

$$9cz - 4ax - 6by$$

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

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:-

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

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

Solution:-

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

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

Solution:-

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

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

Solution:-

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

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

Solution:-

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

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

Solution:-

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

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:-

$$\begin{array}{r} -m^2 + 3m + 6 \\ \pm m^2 \pm m \pm 4 \\ \hline -2m^2 + 2m + 2 \end{array}$$

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

Question 6.

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

Solution:-

$$\begin{array}{r} 5y^2 + y - 3 \\ y^2 - 3y + 7 \\ \hline 6y^2 - 2y + 4 \end{array}$$

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

Question: 7

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

Solution:-

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

Question: 8

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

Solution:-

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

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

Solution:-

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