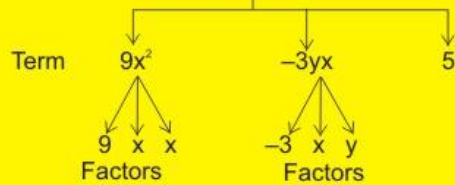


Algebraic Exp. : $9x^2 - 3xy + 5$

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graph TD; A["Algebraic Exp. : 9x^2 - 3xy + 5"] --> B["9x^2"]; A --> C["-3xy"]; A --> D["5"]; B --> E["9"]; B --> F["x"]; B --> G["x"]; C --> H["-3"]; C --> I["x"]; C --> J["y"]; D --> K["5"];
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Term

Factors



Like & Unlike terms

Like term having same algebraic factor..

Ex. $3xy$, $5xy$

$$3xy = 3 \times x \times y$$
$$5xy = 5 \times x \times y$$

Unlike term having diff. algebraic factor.

Ex. $4x^2y$ = $4 \times x \times x \times y$

$$2xy = 2 \times x \times y.$$

Ex. $3xy, 5xy$

$$3xy = 3 \times x \times y$$

$$5xy = 5 \times x \times y$$

Unlike term having diff. algebraic factor.

Ex. $4x^2y = 4 \times x \times x \times y$

$$2xy = 2 \times x \times y.$$

Degree

Highest power of the variable in a term.

Ex. $3x^2 + x + 1$ deg 2

Ex. $x^1y^1z^1 + x^2 + 1$ deg 3

* if term contain more than one variable
we have to add the power of all variable.

Ex. $3x^2 + x + 1$ deg 2

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Division

Ex. Divide.

$$15x^3 + 12x^2 + 21x \text{ by } 3x$$

Sol.

$$\begin{array}{r} 15x^3 + 12x^2 + 21x \\ \underline{3x} \\ 15x^3 + 12x^2 + 21x \\ \underline{3x} \\ 15x^3 + 12x^2 + 21x \\ \underline{3x} \\ 5x^2 + 4x + 7 \end{array}$$

* When the remainder is zero the divisor is called a factor of the dividend..

Ex. Find the value of a if $2x - 3$ is a factor of $2x^4 - x^3 - 3x^2 - 2x + a$.

Sol. First we divide $2x^4 - x^3 - 3x^2 - 2x + a$ by $2x - 3$.

$$\begin{array}{r} 2x-3 \overline{) 2x^4 - x^3 - 3x^2 - 2x + a} \\ \underline{2x^4 - 3x^3} \\ 2x^3 - 3x^2 \\ \underline{ 2x^3 - 3x^2} \\ -2x + a \\ \underline{ -2x + 3} \\ + - 3 \\ \underline{ + - 3} \\ 0 \end{array}$$

$2x - 3$ is a factor of $2x^4 - x^3 - 3x^2 - 2x + a$ if,
 $a - 3 = 0$ Hence, $a = 3$.

$$15x^3 + 12x^2 + 21x \text{ by } 3x$$

Sol.
$$\frac{15x^3 + 12x^2 + 21x}{3x}$$
$$= \frac{15x^3}{3x} + \frac{12x^2}{3x} + \frac{21x}{3x}$$
$$= 5x^2 + 4x + 7$$

* When the remainder is zero the divisor is called a factor of the dividend..

Ex. Find the value of a if $2x - 3$ is a factor of $2x^4 - x^3 - 3x^2 - 2x + a$.

Sol. First we divide $2x^4 - x^3 - 3x^2 - 2x + a$ by $2x - 3$.

$$\begin{array}{r} 2x-3 \overline{) 2x^4 - x^3 - 3x^2 - 2x + a} \left(x^3 + x^2 - 1 \right. \\ \underline{2x^4 - 3x^3} \\ 2x^3 - 3x^2 \\ \underline{ 2x^3 - 3x^2} \\ -2x + a \\ \underline{-2x + 3} \\ a - 3 \end{array}$$

$2x - 3$ is a factor of $2x^4 - x^3 - 3x^2 - 2x + a$ if,
 $a - 3 = 0$ Hence, $a = 3$.

Multiplication

Ex. Multiply $(x + y)(x^2 + y^2 - xy)$

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

Sol. $x(x^2 + y^2 - xy) + y(x^2 + y^2 - xy)$

$$\begin{aligned} & x^3 + xy^2 - x^2y + y^3 - xy^2 + yx^2 \\ &= x^3 - y^3 \end{aligned}$$

Types of Algebraic Exp

According to the No. of terms

Monomial $\longrightarrow$ Single term Ex. $2xy$

Binomial $\longrightarrow$ Two terms Ex. $x + y$

Trinomial $\longrightarrow$ Three terms Ex. $x + y + z$

Multinomial $\longrightarrow$ More than 3 term
Ex. $x^3 + x^2 + 7x + 1$

Monomial $\longrightarrow$ Single term Ex. $2xy$

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Ex. $x^3 + x^2 + 7x + 1$

Addition & Subtraction

We can add & subtract only the like terms.

Ex. Add $5ab$, $4ab$

Sol. $5ab + 4ab$
 $= (5+4) ab = 9ab$

Ex. Subtract of $7xy$ from $2xy$

Sol. $2xy - 7xy = (2- 7) xy = - 5xy.$

Ex. Add $5ab$, $4ab$

Sol. $5ab + 4ab$
 $= (5+4) ab = 9ab$

Ex. Subtract $7xy$ from $2xy$

Sol. $2xy - 7xy = (2 - 7)xy = -5xy$.

Algebraic Expression

Chart