Algebraic Expression

What is an algebraic expression?

An algebraic expression is a combination of numbers, variables and operations that represents a value.

An expression does not contain an equals sign (=) but does include:

Variable: unknown value

Exponent: unknown value

Coefficient: Number multiplying the variable

$5x^2 + 7$

Terms: Parts separated by + or –

Constant: Number without a variable

Remember: the coefficient of $x = 1x$

What is an algebraic equation?

An algebraic equation states that two expressions are equal.

An equation contains an equals sign (=).

Expressions: Numbers, variables and operations separated by an equals sign.

$$5x^2 + 7 = \sqrt{3}$$

Equation: Two expressions joined by an equals sign.

An expression can be simplified or evaluated, while an equation can be solved.

Translating words into algebra

Addition		Subtraction	
a number plus 4	$x + 4$	a number minus 5	$x - 5$
7 more than n	$n + 7$	8 less than m	$m - 8$
the sum of a and 3	$a + 3$	difference between p and 2	$p - 2$
Multiplication		**Division**	
3 times x	$3x$	divided by 2	$\frac{a}{2}$
double n	$2n$	half of x	$\frac{x}{2}$
product of 4 and y	$4y$	quotient of m and 5	$\frac{m}{5}$

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Like terms

Like terms have the same variable raised to the same power.

Like terms	Non-like terms
• $3x$ and $5x$ • $2ab$ and $-4ab$ • $4m^2$ and m^2	• $3x$ and $5y$ • $2ab$ and $-4a$ • $4m^2$ and m

Simplifying expressions

When an expression contains like terms, we can combine them by adding or subtracting their coefficients. This makes the expression simpler while keeping its value the same.

Steps	Example
1. Identify the like terms	$2m + 4 + 3m - 1$
2. Group the like terms	$(2m + 3m) + (4 - 1)$
3. Combine the coefficients	$5m + 3$

Evaluating expressions

To evaluate an expression, substitute the value of the variable and calculate the answer.

Steps	Example
1. Substitute the value	$3x + 4$ when $x = 4$
2. Calculate	$= 3(4) + 2$ $= 12 + 2$ $= 14$

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