

Numerical Expression

- Contains numbers and mathematical symbols
- Examples:

$$3 + 5 - 2^2$$
$$12 \div 4$$

Algebraic Expression

- contains numbers, variables, and / or mathematical symbols
- $3x + 2y$
- $5n^2 - 4$

Terms

- Parts of an expression separated by + or –
- $4x^2 - 3x + 2$ has 3 terms
- $2a + 2b - c + 5d$ has 4 terms
- $3x^5$ has 1 term

Vocabulary:

$$7x^5 + 2$$

coefficient

(the number in front that you're multiplying by)

exponent

(the power)

Base

(the thing being raised to a power)

constant

(a number by itself with no variable)

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

- What is the exponent on the first term?
- What are the coefficient on the 1st, 2nd, and 3rd terms?
- What number is a constant?

Like terms

- have the same variables and the same exponents
- end the same way
- $4x^2$ and $5x^2$ are like terms
- $3a^5b^3$ and $7a^5b^3$ are like terms
- $5n$ and $6n$ are like terms
- $2x^2y$ and $3xy^2$ are **not** like terms
- $7x^2$ and $4x^3$ are **not** like terms
- $5p^3$ and $3q^3$ are **not** like terms
- $3a^2b$ and $2ba^2$ are like terms (just written in a different order)

Simplifying Expressions

- Use the distributive property to get rid of any parentheses.
- Combine like terms.

Distributive Property

$$4(2x^2 - 5x + 2)$$
$$-3(5n + 2p)$$
$$5(3x - 3y + 5z)$$
$$-2(6a - 2b)$$

Combining like terms

$$4x^2 + 3x - 2x^2 + 7 + 5x$$

$$8a - 2b + 4a + 7b + 5a - 2b$$

Both distributive and like terms

$$3(2x + 5) + 4x$$

$$7 + 2(5x^2 + 3x - 1) + 2x$$

SOLVING EQUATIONS

- **Goal:** Find the one value of the variable that makes the sentence true.
- We can find this by doing the **OPPOSITE** of what has been done to the variable in the problem.
- If a problem says +, you subtract.
- If a problem has multiplication, you divide.

Typical equation problems:

$$5x - 2 = 13$$

$$13x + 481 = 1417$$

$$4x + 38 = 50$$

$$-8g + 75 = 43$$

$$48 = 8n - 32$$

$$12f - 94 = 14$$

$$9d - 17 = 80$$

$$2x + 17 = 48$$

$$40 = 76 - 4x$$

$$25 - 2y = -8$$

Things that can complicate solving equations ...

Parentheses

- Use distributive property first.
 $4(3x - 7) = 104$

$$2(5n + 9) = 402$$

Like terms

- Combine them first.

$$8x + 7 - 3x + 14 = 86$$

$$-2p + 5p - 2 = 47$$

Variable on Both Sides

- Find the smaller number of the variable, and subtract that on both sides.
- Solve the remaining problem.

$$9x - 13 = 7x + 45$$

$$8n + 15 = 5n + 84$$

$$3x + 58 = 7x + 21$$

Fractions

- First multiply **every** term in the equation by a number that will cancel all the fractions.
- If necessary combine like terms.
- Solve.

$$\frac{x}{2} + \frac{3}{5} = 7$$

$$\frac{x}{7} + \frac{2x}{3} = 4$$