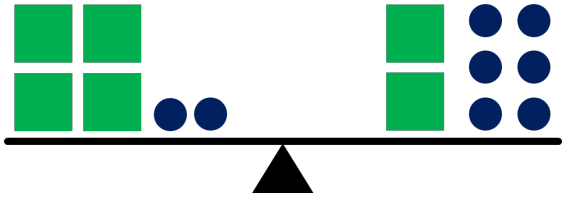
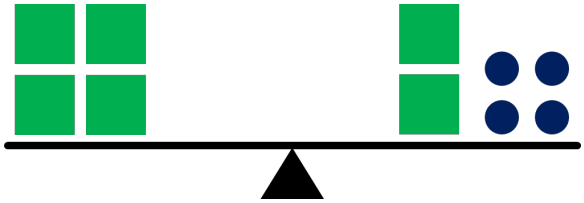
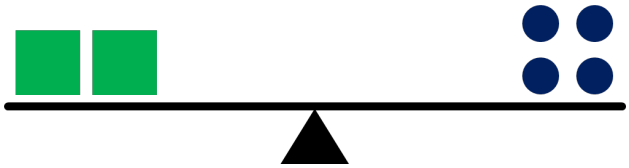
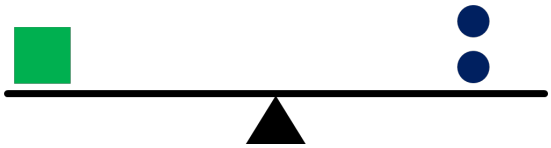
Lesson 8: Equations

Objectives	Terms
• To distinguish between expressions and equations. • To set up and solve equations while maintain equivalency. • To determine if equivalency is maintained by checking your work.	• Expression • Equation • Equivalent Equation • Simplify • Transform

Think about this: What can we determine about the shapes based on the diagrams?

A		**What can we do to determine the relationship between the shapes?**
B		**What did we do to get from A to B?**
C		**What did we do to get from B to C?**
D		**What did we do to get from C to D?**
	What is the relationship between the shapes in the diagrams?	**Write an equation that represents this scenario:**

Lesson 8: Equations

Definitions:

- **Equation:** Two expressions joined by an _____
- **Remember:** An _____ is numbers or variables joined by an _____.

Examples of Equations:

$$x^2 = 3x$$

$$\frac{2x+5}{x} = \frac{25x}{3}$$

Practice

For each of the following, **circle** if it is an expression, an equation, or neither.

1. $\frac{x+7}{x} = 49$ Expression Equation Neither

2. $\frac{x^2-25}{x+5} =$ Expression Equation Neither

3. $x + 3$ Expression Equation Neither

Think about this: What does "equivalent equations" mean? How can we transform equations and maintain equivalency?

Equation	Equivalent Equation	What did we do?
$\frac{x+7}{x} = 49$		
$\frac{x^2-25}{x+5} = 1$		
$x + 3 = 10$		

Lesson 8: Equations

Equations

- **What can we do with equations?**
  - Solve for a variable by _____ into an equivalent equation.
    - _____ is making the same changes to both expressions, on each side of the equation.

  - **Equivalent Equations:** _____ equations that have the same values and solutions.
    - **Remember:** In an equation, you can _____expressions on each side of the equal sign by using _____ and **simplifications** to rewrite the expressions and create equivalent equations**.**
    - **Simplifications include:**
      - Combining like terms
      - Distribution
      - Factoring

Practice

1. Solve the equation for x.

   - Show your work and justify each step.

$$6x - 12 = 36$$

Check your work.

H**ow can we check our work?**

- The answer will be in the form of an equation with a variable on one side of the equal sign and a number on the other side. For example: x = 7.
- Substitute the final answer into the _____.
- If we get a true statement, then our answer is correct.
  - If x + 3 = 10 and x = 7: 7 + 3 = 10 is true

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2. Solve the equation for x. Show your work and justify each step.

$1 + 2x + 4 =$ _____

Check your work.

3. Solve the equation for x. Show your work and justify each step.

$3(2x - 1) - x =$ _____

Check your work.

Summary of Equations

- We solved for the variable by transforming into an equivalent equation. This was done by:
  - _____ the expressions within the equation.
  - Transform by Adding/Subtracting/Multiplying/Dividing the same number or expression on both sides of the equal sign.
- We checked our work by:
  - _____ the final answer into the original equation.
  - A _____ statement meant that our answer was correct.

Where will you see these concepts in upcoming material?	What are the calculator skills are needed?