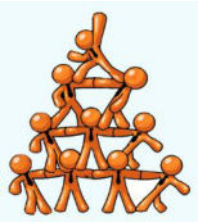
4-3: Learning Goals

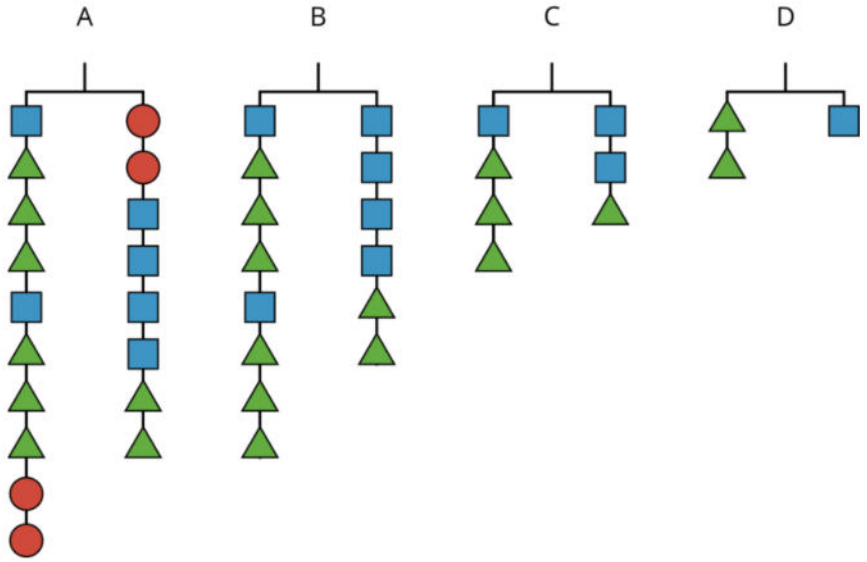
- Let's rewrite equations while keeping the same solutions.

4-3-1: Matching Hangers

1. Write the equation that goes with each figure:
2. Each variable (x, y, and z) represents the weight of one shape. Which goes with which?
3. Explain what was done to each equation to create the next equation. If you get stuck, think about how the hangers changed.



Figures A, B, C, and D show the result of simplifying the hanger in Figure A by removing equal weights from each side.



Here are some equations. Each equation represents one of the hanger diagrams.

$$2(x+3y) = 4x+2y$$

$$2y = x$$

$$2(x+3y)+2z = 2z+4x+2y$$

$$x+3y = 2x+y$$

4-3-2: Matching Equation Moves

Your teacher will give you some cards. Each of the cards 1 through 6 show two equations. Each of the cards A through E describe a move that turns one equation into another.

1. Match each number card with a letter card.
2. One of the letter cards will not have a match. For this card, write two equations showing the described move.

1

$$3x + 7 = 5x$$

$$7 = 2x$$

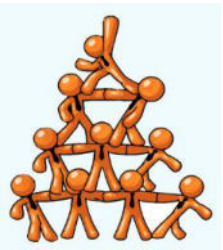
Multiply each side by $-\frac{1}{3}$ A

2

$$12x + 3 = 6$$

$$4x + 1 = 2$$

Add $-3x$ to each side. B



4-3-3: Keeping Equality

1. Noah and Lin both solved the equation $14a = 2(a-3)$.
   Do you agree with either of them? Why?

   Noah's solution:

   $$14a = 2(a-3)$$
   $$14a = 2a - 6$$
   $$12a = -6$$
   $$a = -\frac{1}{2}$$

   Lin's solution:

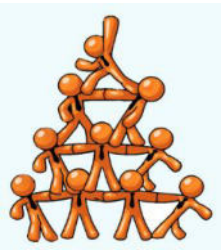
   $$14a = 2(a-3)$$
   $$7a = a - 3$$
   $$6a = -3$$
   $$a = -\frac{1}{2}$$

2. Elena is asked to solve $15 - 10x = 5(x+9)$. What do you recommend she does to each side first?

3. Diego is asked to solve $3x - 8 = 4(x+5)$. What do you recommend he does to each side first?

4-3: Lesson Synthesis

$$6x + 12 = 10x - 4$$



4-3: Learning Targets

- I can add, subtract, multiply, or divide each side of an equation by the same expression to get a new equation with the same solution.

4-3-4: More Matching Moves

Match these equation balancing steps with the description of what was done in each step.

Step 1:

$$12x - 6 = 10$$
$$6x - 3 = 5$$

Step 2:

$$6x - 3 = 5$$
$$6x = 8$$

Step 3:

$$6x = 8$$
$$x = \frac{4}{3}$$

Descriptions to match with each step:

A: Add 3 to both sides

B: Multiply both sides by $\frac{1}{6}$

C: Divide both sides by 2