

Day 5 + 6 Guided Notes

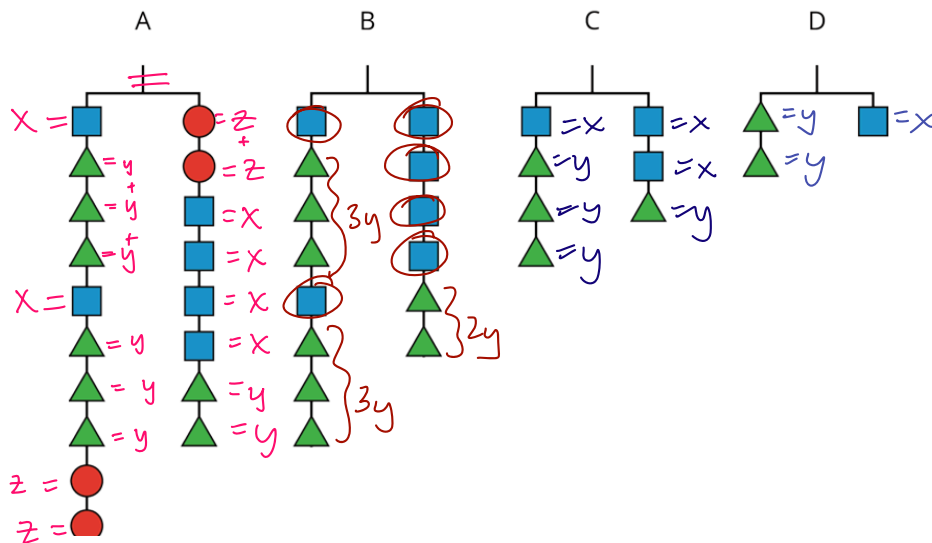
Name: Key

OBJECTIVE

Students will compare and contrast solution paths to solve an equation in one variable by performing the same operation on each side.

Day 5

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



a. Write the equation that goes with each figure:

A: $2x + 6y + 2z = 2z + 4x + 2y$

B: $2x + 6y = 4x + 2y$

C: $x + 3y = 2x + y$

D: $2y = x$

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Practice Problems:

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

Step 1:

$$\begin{array}{l} 12x - 6 = 10 \\ \div 2 \quad \div 2 \quad \div 2 \\ 6x - 3 = 5 \end{array}$$

Step 2:

$$\begin{array}{l} 6x - 3 = 5 \\ +3 \quad +3 \\ 6x = 8 \end{array}$$

Step 3:

$$\begin{array}{l} 6x = 8 \\ \div 6 \quad \div 6 \\ x = \frac{4}{3} \end{array}$$

Descriptions to match with each step:

A: Add 3 to both sides = step 2

B: Multiply both sides by $\frac{1}{6}$ = step 3

C: Divide both sides by 2 = step 1

$x = \frac{8 \div 2}{6 \div 2} = \boxed{\frac{4}{3}}$

2. Match each of the following equations on the left to the corresponding operation done on the right side:

a. $3x + 7 = 5x$

$$7 = 2x$$

b. $12x + 3 = 6$

$$4x + 1 = 2$$

c. $10 - 6x = 4 + 5x$

$$7 - 6x = 1 + 5x$$

d. $-3(4x - 3) = -15$

$$4x - 3 = 5$$

e. $\frac{5x}{-3} = \frac{12}{1}$

$$5x = -36$$

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

2. Add $-3x$ to each side

3. Multiply each side by -3

4. Add -3 to each side

5. Multiply each side by $\frac{1}{23}$

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Day 6

1. $\boxed{-14} + 6k \boxed{+7} - 2k = 1 + 5k$

1. combine like terms:

$$4k - 7 = 1 + 5k$$

2. move 7 to right side

$$\begin{array}{r} 4k - 7 = 1 + 5k \\ +7 \quad +7 \end{array}$$

$$4k = 8 + 5k$$

3. move 5k to left side

$$\begin{array}{r} 4k = 8 + 5k \\ -5k \quad -5k \end{array}$$

$$\begin{array}{r} -k = 8 \\ \div -1 \quad \div -1 \end{array}$$



$$\boxed{k = -8}$$

2. $2x(9 - 5) = 5x + 2$

1. distribute

$$18x - 10x = 5x + 2$$

2. combine like terms

$$8x = 5x + 2$$

3. move 5x to the left

$$\begin{array}{r} 8x = 5x + 2 \\ -5x \quad -5x \end{array}$$

$$3x = 2$$

4. divide both sides by 3

$$\boxed{x = \frac{2}{3}}$$

$$2x(9 - 5) = 5x + 2$$

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

$$8x = 5x + 2$$

$$3x = 2$$

$$\boxed{x = \frac{2}{3}}$$

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Practice Problems:

1. Comparing Methods and Steps of Solving Linear Equations:

Noah and Lin both solved the equation $14a = 2(a - 3)$.

Do you agree with either of them? Why?

Yes, both used different methods to get the correct solution.

- Noah began with distributive property.

- Lin began by dividing both sides by two to "get rid" of parenthesis.

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. Equation 1

$$x - 3 = 2 - 4x$$

Which of these have the same solution as Equation 1? Be prepared to explain your reasoning.

Equation A

$$\frac{2x - 6}{2} = \frac{4 - 8x}{2}$$

$$x - 3 = 2 - 4x$$

✓

Equation B

$$x - 5 = -4x$$

↓
NOPE

Equation C

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

$$2 - 4x = x - 3$$

✓

Equation D

$$-3 = 2 - 5x$$

↓
NOPE

Explanations in class
(groups)

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3.

Here is an equation, and then all the steps Clare wrote to solve it:

$$\begin{aligned}14x - 2x + 3 &= 3(5x + 9) \\12x + 3 &= 3(5x + 9) \\3(4x + 1) &= 3(5x + 9) \\4x + 1 &= 5x + 9 \\1 &= x + 9 \\-8 &= x\end{aligned}$$

Here is the same equation, and the steps Lin wrote to solve it:

$$\begin{aligned}14x - 2x + 3 &= 3(5x + 9) \\12x + 3 &= 3(5x + 9) \\12x + 3 &= 15x + 27 \\12x &= 15x + 24 \\-3x &= 24 \\x &= -8\end{aligned}$$

a. Are both of their solutions correct? Explain your reasoning.

yes, Clare and Lin both have correct solutions, but different approaches.

Student a : response : • Clare : combined like terms & factored on left then divided by 3, and worked from there

• Lin : combined like terms on left then applied distributive property on right side and worked from there

b. Describe some ways the steps they took are alike and different.

Student b : response :

alike :

- combine like terms
- inverse operations

different :

- distributive property (first step)
- simplifying (Clare step 2)
- Clare final step subtraction
- Lin final step division