

## WARM-UP

Solve each equation.

a)  $3x - 5 = 7$

$$3x = 7 + 5$$

$$\frac{3x}{3} = \frac{12}{3}$$

$$x = 4$$

c)  $3 = 3x - 3$

$$+3 + 3 = 3x$$

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

$$2 = x$$

b)  $5 - \frac{f}{4} = -15$

$$5 + 15 = \frac{f}{4}$$

$$20 = \frac{f}{4} \text{ cross multiply}$$

$$80 = f$$

d)  $11 = 5x + 6$

$$11 - 6 = 5x$$

$$\frac{5}{5} = \frac{5x}{5}$$

$$1 = x$$

## UNIT 1: Solving Algebraic Equations Solving Multi-Step Linear Equations

Learning Goal:

I will learn how to solve multi-step linear equations.



### Lesson A: Solving Equations with Two

Steps to Solve:

1. Choose a letter side & a number side.
2. Simplify by collecting like terms.
3. Divide or multiply to get the variable (letter) by itself.

Examples

a)  $5x - 8 = x + 8$

$$5x - x = 8 + 8$$

$$\frac{4x}{4} = \frac{16}{4}$$

$$x = 4$$

You Try!

c)  $-3 + 4m = 30 - 3m - 4m$

$$-3 + 4m = 30 - 7m$$

$$4m + 7m = 30 + 3$$

$$\frac{11m}{11} = \frac{33}{11}$$

$$m = 3$$

b)  $2x + 7 = 5x + 10 + 3$

$$2x + 7 = 5x + 13$$

$$7 - 13 = 5x - 2x$$

$$-6 = \frac{3x}{3}$$

$$-2 = x$$

d)  $w + 13 - 3w = 1 - 6w$

$$w - 3w + 6w = 1 - 13$$

$$\frac{4w}{4} = \frac{-12}{4}$$

$$w = -3$$

### Lesson B: Solving Equations with Brackets

## Reminder!

We use distributive property (aka. rainbow effect) to remove brackets.

Example:

$$6(2x - 3)$$

$$= 12x - 18$$

# Solving Multi-Step Equations.notebook

## Lesson B: Solving Equations with Brackets

### Steps to Solve:

1. Expand all brackets by distribution property.
2. Move all variables to one side and numbers on the other. (opposite operations!)
3. Simplify by collecting like-terms.
4. Solve for the variable.

### Examples

a)  $4(k-2) = 9k+2$

$$4k-8 = 9k+2$$

$$-8-2 = 9k-4k$$

$$\frac{-10}{5} = \frac{5k}{5} \quad \boxed{-2=k}$$

b)  $3g-1 = 5(g-2) + 11$

$$3g-1 = 5g-10+11$$

$$-1+10-11 = 5g-3g$$

$$\frac{-2}{2} = \frac{2g}{2} \quad \boxed{-1=g}$$

c)  $8(x+3) = 2(x-3)$

$$8x+24 = 2x-6$$

$$8x-2x = -6-24$$

$$\frac{6x}{6} = \frac{-30}{6}$$

$$\boxed{x=-5}$$

d)  $4y+5(7y-3) = 9(y-5)$

$$4y+35y-15 = 9y-45$$

$$4y+35y-9y = -45+15$$

$$\frac{30y}{30} = \frac{-30}{30}$$

$$\boxed{y=-1}$$

## UNIT 1: Solving Algebraic Equations

### Solving Multi-Step Equations

#### Learning Goal:

I will learn how to solve multi-step equations.

#### Success Criteria:

To be successful, I must be able to...

- Solve equations with two variables by collecting like terms and getting the variable by itself.
- Solve equations with brackets by using distributive property and then getting the variable by itself.

#### Example:

$$4(5n-7) = 10n+2$$

$$20n-28 = 10n+2$$

$$20n-10n = 2+28$$

$$\frac{10n}{10} = \frac{30}{10}$$

$$\boxed{n=3}$$

#### Homework:

"Solving Equations with 2 or More Variables" and "Why Do Girls Like Guys Who Wear Shirts with 8 Buttons?"