

Warm-up

Real World Application

You are ordering pizzas and sandwiches. You have a budget of \$80. If a pizza costs \$10 and sandwiches cost \$5. How many sandwiches can you buy if you buy 4 pizzas? 5 pizza? Explain

Write an equation.

Literal Equations and Formulas

Name

Date:

Block:

What are literal equations?

Equations that involves two or more different variables.

How do you solve literal equations?

Use the same method you learned when solving equations with one variable (isolate the variable you are solving for)

Example 1:

$$10x + 5y = 80 \quad \text{Solve for } y:$$

Find y when $x = 3$

Example 2:

Solve the equation $4 = 2m - 5n$ for m

Literal Equations

Example 3:

$$ax - b = c \text{ solve for } x$$

Formulas

Example 4:

What is the radius of a circle with circumference of 64ft?
Round to the nearest tenth.

Step 1: What is the formula?

$$C = 2\pi r$$

Step 2: Simplify

Step 3: Substitute the given information and solve.

You Try:

1. What is the radius of a circle with circumference 22m?
2. $C = \frac{5}{9}(F - 32)$ for F

Linear Equations	LEQ: How do I solve an equation with two variables?
Linear Equation	an equation that involves two or more variables
Steps	<p> 1. Box the variable that you are looking for 2. Perform the inverse operation 3. Solve </p> <div style="text-align: center;"> $\begin{array}{r} \boxed{y} \\ 10x + y = 80 \\ \underline{-10x} \qquad \underline{-10x} \\ y = 80 - 10x \end{array}$ </div> <p> find y when $x = 3$ and when $x = 6$ $y = 80 - 10(3)$ $y = 80 - 10(6)$ $y = 80 - 30$ $y = 80 - 60$ $y = 50$ $y = 20$ </p>

Linear Equations **LEQ: How do I solve an equation with two variables?**

Linear Equation an equation that involves two or more variables

- Steps**
1. Box the variable that you are looking for
 2. Perform the inverse operation
 3. Solve

$$\boxed{x}$$

$$\begin{aligned} 10x + 5y &= 80 \\ -5y \quad -5y & \\ \hline 10x &= 80 - 5y \\ \frac{10}{10} & \quad \frac{10}{10} \\ x &= 8 - 1/2y \end{aligned}$$

find y when $x = 3$ and when $x = 6$

$$y = 8 - 1/2(3)$$

$$y = 8 - 1.5$$

$$y = 6.5$$

$$y = 8 - 1/2(6)$$

$$y = 8 - 3$$

$$y = 5$$

Warm Up

1) Solve for r: $C = 2\pi r$

2) Solve for r: $A = \pi r^2$

3) Solve for w: $P = 2L + 2w$

4) Solve for y: $-3x + 2y = 8$

Solve for y
 $54x + 18y = 180$

Solve for y
 $12y - 48x = 36$

Solve for y
 $15x - 5y = 50$

Solve for x
 $54x + 18y = 180$

Solve for x
 $12y - 48x = 36$

Solve for x
 $15x - 5y = 50$

Connect 4 Activity:

Fold your paper into 16 boxes.

- Write the numbers 1-16.
- Highlight 4 in a row column or diagonal.
- Complete the appropriate problems that were highlighted.
- Share your solutions with your partner.
- Write down any questions that you and your partner still need addressed on a sticky note.
- Turn in for a classwork grade.

1) Use inverse operations to solve for the desired variable.

Ex) $A = \pi r^2$

Solve r .

$$\infty \frac{A}{\pi} = \frac{\pi \cdot r^2}{\pi}$$

$$\sqrt{\frac{A}{\pi}} = \sqrt{r^2}$$

$$r = \sqrt{\frac{A}{\pi}}$$

Ex) $E = mc^2$

Solve m .

$$\frac{E}{c^2} = \frac{m \cdot c^2}{c^2}$$

$$m = \frac{E}{c^2}$$

$$\text{Ex) } 3x + 4y = 12 \quad \text{for } y.$$

$$\begin{array}{r} -3x \\ \hline \end{array}$$

$$\frac{4y}{4} = \frac{-3x}{4} + \frac{12}{4}$$

$$y = -\frac{3}{4}x + 3$$

Q&A

1) If there is a neg then add. $3x + 2 = 3x - 1$ $4x + 3 = 12 + 9x$
→ lower; add b/c neg.

2) Once you add/subtract, then it cancels use /
 $2 \neq -1$

3) when they are together = multiplication
so you have to divide = inverse

4) same variable: add them

different variables: it is what it is = separate

4) $S = 4x$ divide each side by 4.
 $x = \frac{S}{4}$

10) $4p - 5c = 3c$ $\frac{4p}{4} = \frac{8c}{4}$ $p = 2c$

$$7) m = 2(x+n) \quad \text{for } n. \quad \frac{4d}{4d}$$

$$\text{DP: } m = 2x + 2n$$

$$\frac{-2x \quad -2x}{m - 2x = 2n}$$

$$\frac{m - 2x}{2} = \frac{2n}{2}$$

$$\boxed{\frac{m}{2} - x = n}$$

$$16) 4ad + 4d = 8g \quad \text{for } a.$$

$$\frac{4d(a+1)}{4d} = \frac{8g}{4d}$$

$$a+1 = \frac{8g}{4d} \quad (16)$$

$$-1 \quad -1$$

$$\boxed{a = \frac{2g}{d} - 1}$$

4.6 Solving for a Variable

Example: If $5x + y = 19$, then $y =$

Solution: The goal is to have only y on the side of the equation and the rest of the terms on the other side of the equation.

$$5x + y = 19 \quad \text{subtract } 5x \text{ from both sides.}$$

$$y = 19 - 5x$$

Example: If $7m + n = 30$, then $m =$

Solution: The goal is to have only m on the side of the equation and the rest of the terms on the other side of the equation.

$$7m + n = 30 \quad \text{subtract } n \text{ from both sides.}$$

$$7m = 30 - n \quad \text{divide both sides by } 7.$$

$$m = \frac{30 - n}{7}$$

Solve each of the equations below for the variable indicated.
Be sure to follow inverse operations.

1. If $4a + b = 12$, then $a =$

2. If $6c - d = 17$, then $d =$

3. If $3m - n = 11$, then $m =$

4. If $7r + 5s = 35$, then $r =$

5. If $8m - 9n - 2m = 6n$, then $m =$

6. If $-10y - 3x - x = -12y$, then $x = \underline{\hspace{2cm}}$

7. If $-4t + 4t - 2s = 8$, then $s = \underline{\hspace{2cm}}$

8. If $5x - 7y + 9y = -9x + 3$, then $y = \underline{\hspace{2cm}}$

9. If $-10b + 7a + 3a = -4b$, then $a = \underline{\hspace{2cm}}$

10. If $7x - 8y + x = 5y + 3$, then $x = \underline{\hspace{2cm}}$