

AIM: 3-1 I will be able to find a solution to an algebraic equation!

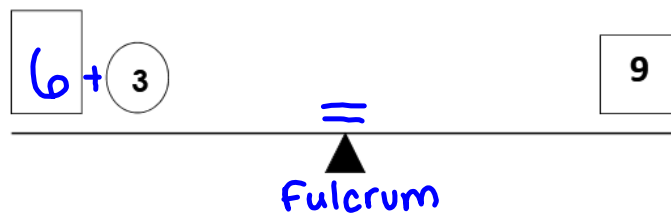
Name _____
Mrs. Ashley

Date _____
Math 6 - Period _____

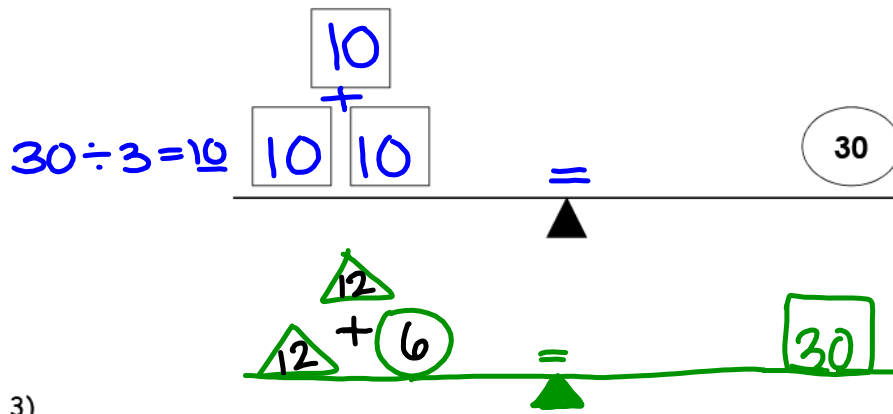
Warm-up:

Each scale below is balanced. Fill in the empty shapes with numbers that will keep the scale balanced.

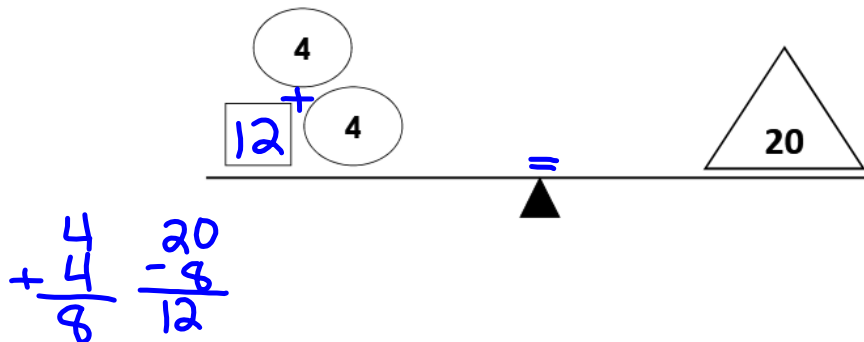
1)



2)



3)





Let's Investigate:

What is the difference between an equation and an expression?

An equation is a mathematical sentence showing two expressions are equal.

An equation contains an equal sign.

Equation
Definition
Equations have numbers, variables, operations (+, -, x, ÷)
Example
$x + 2 = 4$

Expression
Definition
Expressions have <u>NO</u> <u>EQUAL</u> sign. They have #'s, variables, operations.
Example
$x + 2$

How are an equation and an expression similar?
They both have #'s, variables, operations.

How are an equation and an expression different?

$x + 2 = 4$ ← SOLVE
 $x = 2$
number answer
solution

no equal sign
SIMPLIFY → $2x + 3x$
↓
 $5x$

Vocabulary:

1. **Equation** - A mathematical sentence showing two expressions are equal. An equation contains an equal sign, =.
 2. **Substitution** - When you replace a variable with a value that results in a true number sentence.
 3. **Solution** - The **answer** to an equation; the value of the unknown variable in an equation that results in a true number sentence.
- =====

Examples:

Determine whether the given value is a solution of the equation below. Show your work.

$$x + 9 = 15$$

a) Is $x = 6$ a solution to the equation above? *Hint: substitute 6 in for x!

answer
↑

$$\begin{aligned} x + 9 &= 15 \\ 6 + 9 &= 15 \\ 15 &= 15 \quad \checkmark \end{aligned}$$

$x = 6$ is (is/is not) a solution of $x + 9 = 15$.

b) Is $x = 7$ a solution to the equation above?

$$\begin{aligned} x + 9 &= 15 \\ 7 + 9 &= 15 \\ 16 &\neq 15 \end{aligned}$$

\neq not equal to
 $=$ equal to

$x = 7$ is not (is/is not) a solution of $x + 9 = 15$.

c) How many solutions are there to the equation $x + 9 = 15$?

1 solution
 $x = 6$



Now You Try!

1) Is $y = 8$ a solution to the equation $\frac{y}{4} = 32$? Show your work and substitutions.

$$\frac{8}{4} = 32$$

$$2 \neq 32$$

Answer: $y = 8$ is not (is is not) a solution of $\frac{y}{4} = 32$.

2) Which of the following is a solution to the equation $n^2 + 3 = 19$? Show your work!

*Hint: Check ALL choices!

$$\begin{aligned} 0^2 + 3 &= 19 \\ 0 + 3 &= 19 \\ 3 &\neq 19 \end{aligned}$$

~~a) 0~~

$$\begin{aligned} 2^2 + 3 &= 19 \\ 4 + 3 &= 19 \\ 7 &\neq 19 \end{aligned}$$

~~b) 2~~

$$\begin{aligned} 4^2 + 3 &= 19 \\ 16 + 3 &= 19 \\ 19 &= 19 \end{aligned}$$

c) 4

$$\begin{aligned} 6^2 + 3 &= 19 \\ 36 + 3 &= 19 \\ 39 &\neq 19 \end{aligned}$$

~~d) 6~~

3) Is $n = 0$ a solution to the equation $3n + 2 = 2n + 3$? Show your work!

$$\begin{array}{r|l} 3 \cdot 0 + 2 & 2 \cdot 0 + 3 \\ 0 + 2 & 0 + 3 \\ \hline 2 & \neq 3 \end{array}$$

Answer: $n = 0$ is not (is is not) a solution of $3n + 2 = 2n + 3$.

4) Circle the equation(s) where $x = 5$ is a solution. Choose all that apply. Show your work!

(a) $2x + 4 = 14$

$$\begin{aligned} 2 \cdot 5 + 4 &= 14 \\ 10 + 4 &= 14 \\ \downarrow \\ 14 &= 14 \end{aligned}$$

(b) $5x = 55$

$$\begin{aligned} 5 \cdot 5 &= 55 \\ 25 &\neq 55 \end{aligned}$$

(c) $8 + 3x = 23$

$$\begin{aligned} 8 + 3 \cdot 5 &= 23 \\ 8 + 15 &= 23 \\ \downarrow \\ 23 &= 23 \end{aligned}$$

(d) $\frac{x}{5} = 1$

$$\begin{aligned} \frac{5}{5} &= 1 \\ \downarrow \\ 1 &= 1 \checkmark \end{aligned}$$

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Name _____

3-1 MATH HW

1) Is the equation $15 - x = 10$ true when $x = 4$? Show your work and substitutions AND write your answer in a complete sentence.

2) Is the equation $3x + 7 = 16$ true when $x = 3$? Show your work and substitutions AND write your answer in a complete sentence.

3) Which of the numbers in the set $\{9, 11, 4, 7\}$ is a solution for the following equation? Show your work and substitutions.

$$2(3b + 2) + 4 = 50$$

4) Which of the following is a solution to the equation $7y + 15 = 50$? Check all choices!

A) $y = 4$

B) $y = 5$

C) $y = 7$

D) $y = 9$

5) My friend, Brooke, is from Australia where they measure temperature in degrees Celsius. When she was visiting New York, she would get so confused because we measure temperature in degrees Fahrenheit. One day, the temperature in New York was 50°F. She guessed that 50°F was the same as 15°C. Was she correct?



The equation below represents the temperature in degrees Fahrenheit (F), based on degrees Celsius (C).

$$F = \left(C \times \frac{9}{5} \right) + 32$$

a) Rewrite the equation given the information we know.

b) Was Brooke's guess correct? Explain why or why not. If Brooke's guess was incorrect was it too high or too low?

6) If the temperature is 25°C, what temperature will it be in degrees Fahrenheit? Use the formula below to find your answer. Show all work!

$$F = \left(C \times \frac{9}{5} \right) + 32$$