M8 - 10.9 - Creating/Solving Equations Notes

Pick a Number.

Let x = the number Let Statements

Word	Meaning
Sum, More, Add, Increased	+
Difference, Less, Subtract, Decreased, Take away	_
Product, Times, Multiplied	×
Quotient, Divide, Split	÷

Words Problems Let Statements Equation Isolate Solve (Algebra) Answer! Check Answer!

Expressions

Three more than a number x + 3

Eight less than a number x - 8

A number less than four 4-x

Five times a number 5x

A third of a number $\frac{1}{3}x$

Twice the sum Eight divided of a number by a number and three 8 2(x + 3) \bar{x}

A number plus four "ALL" divided by two x + 42

Create and Solve the following:

Five more than a number is 8. What is the number?

Let x = the #

Let Statements

x + 5 = 8

Create Equation

$$x + 5 = 8$$

$$-5 - 5$$

$$x = 3$$

Solve

Check Answer x + 5 = 8(3) + 5 = 88 = 8

The number is 3

Answer the question

Twice the "SUM" of a number and three is 12. What is the number?

Let x = the number

$$2(x + 3) = 12$$

$$2(x+3) = 12$$
$$2x+6 = 12$$
$$-6 - 6$$
$$2x = 6$$
$$\frac{2x}{2} = \frac{6}{2}$$

Check Answer

$$2(x+3) = 12$$

 $2((3) + 3) = 12$
 $2(6) = 12$

x = 3

The number is 3

Three less than twice a number is 7. What is the number?

Let
$$x = \#$$

$$2x - 3 = 7$$

$$2x - 3 = 7$$

$$+3 + 3$$

$$2x = 10$$

$$\frac{2x}{2} = \frac{10}{2}$$

x = 5

The number is 5

Check Answer

$$2x - 3 = 7$$

$$2(5) - 3 = 7$$

$$10 - 3 = 7$$

$$7 = 7$$

Five times a number plus three "ALL" divided by two equals triple the number. What is the number?

Let
$$x = \#$$

$$\frac{(5x+3)}{2} = 3x$$

$$5x + 3 = 3x \times 2$$

$$5x + 3 = 6x$$

$$-5x - 5x$$

The number is 3

Check Answer

$$\frac{5x + 3}{2} = 3x$$

$$\frac{5(3) + 3}{2} = 3(3)$$

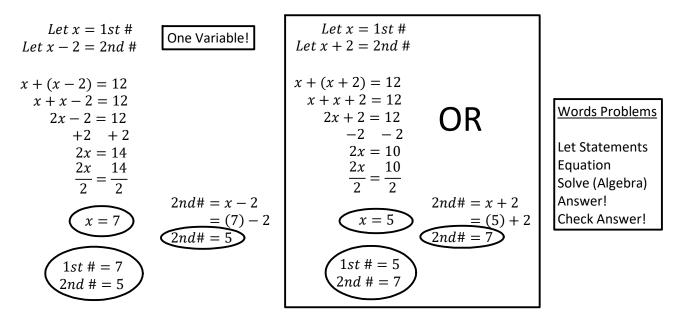
$$\frac{18}{2} = 9$$

$$9 = 9$$

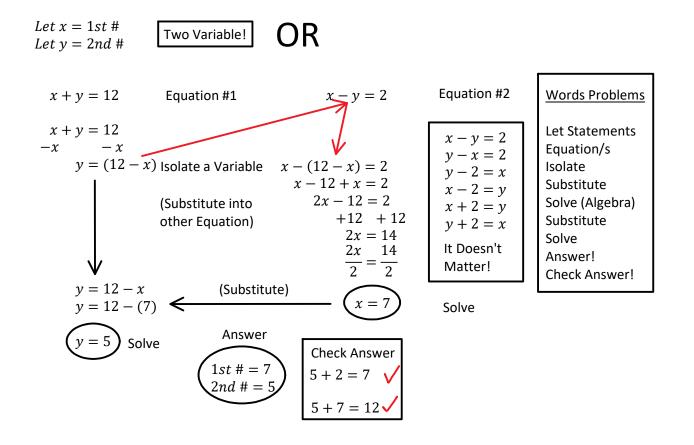
M8 - 10.9 - One vs Two Variable Equations Notes

Create and Solve the following:

One number is two more than another and their sum is 12. What are the numbers?



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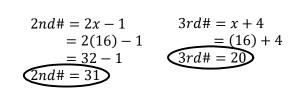
M8 - 10.9 - 2/3 Number/Consecutive Equations Notes

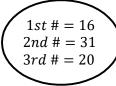
Create and Solve the following:

The sum of three numbers is 67. The 2nd number one less than is twice the 1st. The 3rd number is four more than the 1st.

Let
$$x = 1st \#$$

Let $2x - 1 = 2nd \#$
Let $x + 4 = 3rd \#$
 $x + 2x - 1 + x + 4 = 67$
 $x + 2x - 1 + x + 4 = 67$
 $4x + 3 = 67$
 $-3 - 3$
 $4x = 64$
 $\frac{4x}{4} = \frac{64}{4}$
1st # = 16 $x = 16$





Check Answer 16 + 31 + 20 = 67

The sum of three consecutive integers is 24.

x = 7

Let
$$x = 1st #$$

Let $x + 1 = 2nd #$
Let $x + 2 = 3rd #$

Consecutive Integers: ie. -2,-1,0,1,2,3,4,5,6 Consecutive Even Integers: ie. -2,0,2,4,6 Consecutive Odd Integers: ie. -1,1,3,5,7

$$x + x + 1 + x + 2 = 24$$

$$x + x + 1 + x + 2 = 24$$

$$3x + 3 = 24$$

$$-3 - 3$$

$$3x = 21$$

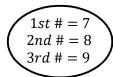
$$\frac{3x}{3} = \frac{21}{3}$$

$$1st \# = 7$$

$$x = 7$$

$$2nd# = x + 1 = (7) + 1 2nd# = 8$$

$$3rd# = x + 2 = (7) + 2 3rd# = 9$$



Check Answer 7 + 8 + 9 = 24

Find three consecutive odd integers where five less than triple the 2nd is quadruple the 1st.

Let
$$x + 4 = 3rd\#$$

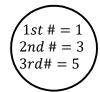
 $3(x + 2) - 5 = 4x$
 $3(x + 2) - 5 = 4x$
 $3x + 6 - 5 = 4x$
 $3x + 1 = 4x$
 $-3x$ $-3x$
 $1 = x$

1st # = 1

x = 1

Let x = 1st #*Let* x + 2 = 2nd #

$$2nd# = x + 2$$
 $3rd# = x + 5$
= (1) + 2 = (1) + 4
 $2nd# = 3$ $3rd# = 5$



Check Answer 3(3) - 5 = 4(1)9 - 5 = 44 = 4

M8 - 10.9 - Age/Now-Then Equations Notes

Create and Solve the following:

Four years less than triple Mark's age equals fourteen years more than double his age. How old is Mark?

Let
$$m = Mark's$$
 age

$$3m - 4 = 2m + 14$$

$$3m - 4 = 2m + 14$$

 $-2m - 2m$
 $m - 4 = 14$
 $+4 + 4$

$$m = 18$$

Answer

Mark is 18 years old Check Answer

$$3(18) - 4 = 2(18) + 14$$

If Nicole were triple her age she was three years ago she would be twice her current age. How old is Nicole now?

Let
$$n = Nicole's$$
 age
Let $n - 3 = Nicole's$ age 3 years ago
Let $2n = Twice\ Nicole's$ age

$$3(n-3) = 2n$$

$$3(n-3) = 2n$$

$$3n-9 = 2n$$

$$-3n$$

$$-9 = -n$$

$$\frac{-9}{-1} = \frac{-n}{-1}$$

$$9 = n$$

Check Answer
$$3(9-3) = 2(9)$$

$$3(6) = 2(9)$$

$$18 = 18$$

Answer

n = 9

Nicole is 9 years old now