

Name \_\_\_\_\_

**Algebra 2**  
**Lesson 1-3**  
**Solving Equations**

Back to the basic basics! An **equation** is a mathematical statement with an equals (=) sign and two equivalent expressions. A **solution** to an equation is the set of values or a value that makes the equation true. A **linear equation in one variable** simply means that the equation contains one (1) variable *with* an exponent value of one (1). See examples:

$$2y=6$$

$$3x+5=-2$$

$$7n+3=2n-1$$

Why do I say “exponent value of one?”

Some facts and terminology about **=** . We will start out using the variables a, b, and c to be real numbers.

<b>Reflexive Property:</b>	$a=a$
<b>Symmetric Property</b>	if $a=b$ , then $b=a$
<b>Transitive Property</b>	if $a=b$ and $b=c$ , then $a=c$
<b>Addition Property</b>	if $a=b$ , then $a+c=b+c$
<b>Subtraction Property</b>	if $a=b$ , then $a-c=b-c$
<b>Multiplication Property</b>	if $a=b$ , then $ac=bc$
<b>Division Property</b>	if $a=b$ and $c \neq 0$ , then $\frac{a}{c} = \frac{b}{c}$
<b>Substitution Property</b>	if $a=b$ , then b may be substituted for a in any expression to obtain an equivalent expression

**Steps to solve a one variable equation:**

1. Isolate variables onto one side of the equation (preferably left) by using the inverse properties.
2. Combine like terms.
3. Apply multiplication inverse property if needed to get a single variable with no coefficients.
4. Check your answer!

*Remember!* even when there are multiple variables in an equation, you can solve for one variable in terms of the other variables.

**Example—**

Solve:  $3(n+2)=6$

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

The area of a triangle is given by the following equation:  $A=1/2bh$ , solve this equation for h

$$A = \frac{1}{2}bh$$

In other words, the height of the triangle is equal to two times the area divided by the length of the base.

Name \_\_\_\_\_

**Algebra 2**  
**Problem Set 1-3**  
**Solving Equations**

1. Solve:

a)  $\frac{m}{-8} = -2.5$

b)  $15 = 3 = 4x$

c)  $\frac{2a}{3} + \frac{1}{5} = \frac{7}{6}$

2. Solve:

a)  $-2x + 4 = 5 - 3x$

b)  $3(q - 2) + 2 = 5q - 7 - 2q$

c)  $5z = -3(z + 7)$

3. Solve for the indicated variable, and state any restrictions on all variables:

a)  $r - 2s = 14$  for  $s$

b)  $P = 2(l + w)$  for  $l$

c)  $5ax + b = 4b - 8ax$

4. Identify the following formulas and solve for the indicated variable.

a)  $A = \frac{1}{2}h(b_1 + b_2)$ , for  $b$

b)  $S = 2\pi r^2 + 2\pi rh$ , for  $h$

5. The length of a dog run is 3 times its width. Write an equation for when the perimeter measures 56 feet.

6. The measurements of two angles of a triangle are 42 and 68 degrees. What is the measurement of the third angle?

7. The sum of 3 consecutive integers is 90. Find the three numbers. (let  $x$ =first integer)

8. A diver dives off the side of a 12 foot deep pool. He touches the bottom of the pool and comes straight up (perpendicular to the surface). He is 22 feet away from the edge of the pool. What is the approximate distance from the edge of the pool to the bottom where the diver touched? (draw a picture)