1.4

Date:

Objective:

Vocabulary:

Base:

Exponent:

Root:

Index:

Absolute Value:

Inverse operation:

**When solving an equation, the object is to get the variable by itself. You do this by doing the order of operations backwards and doing the inverse of each operation.

Steps for Solving a Polynomial with one Variable:

1. get the variable or the parentheses that include the variable by itself
   - Do add/subtract first
   - Then do the multiply/divide

2. take the root, use the exponent as your index number

3. get the variable by itself

Examples: Solve for the variable. Leave answers as a <u>simplified fraction</u>. Show work.

1. $x^2 = 4$

2. $x^3 + 4 = -23$

3. $3x^4 = 48$

4. $4x^2 - 8 = 28$

5. $3x^3 + 10 = 30$

Steps for Solving Radical Equations:
1. Get the root by itself
2. Raise both sides to an exponent (use the index number as your exponent)
3. Get the variable by itself

Example: Solve each radical equation. SHOW WORK!

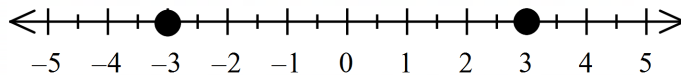1. $\sqrt{x} - 9 = 0$ 　　　　　2. $-4\sqrt{x} + 6 = -18$ 　　　　　3. $2\sqrt[3]{x} = 8$

When we solve an absolute value equation, we need to remember that there are 2 answers.

Steps for Solving Absolute Value Equations:
1. Get the absolute value by itself
2. Write **2** equations
• One equation with a _____ answer
• One equation with a _____ answer
3. Solve both equations

Remember that |3| means the distance from zero is 3. So, this could be a $+3$ or a -3.

$$|x| = 3$$
$$x = 3 \text{ or } x = -3$$

Examples: Solve for the variable. Leave answers as a simplified fraction. Show work.

1. $|x| = 8$ 　　　　　2. $|x| + 5 = 7$ 　　　　　3. $3|x| = -21$

4. $-3|x| - 5 = -6$

Sometimes you will have a formula. Usually, formulas have more than one variable in them. To make the math easier, there are times where you will want to solve the formula for the variable you want to find the value of. Then you can just substitute the numbers into the formula and evaluate with a calculator.

Examples: Solve for the specified variable.
1. $y + 10x = 3$ solve for x

2. $4x + 2y = 14$ solve for y

3. $ax - by = c$ solve for x

4. $I = \dfrac{E}{R}$ solve for R

5. $A = \pi r^2$ solve for r

Example: Read the following situations. Then answer the question. Define your variable. Show your work.
1. How many seconds will it take for a ball to hit the ground when it is dropped from a roof that is 144 feet above the ground? Use the formula $f(h) = -16t^2 + h_0$, where h_0 is the initial height, $f(h)$ is the final height, and t is the time in seconds.

2. A machine is used to file a nut to be 1 centimeter thick. After the nuts are filed, another machine measures them. If the nut measures 0.1 millimeter more or less than the desired length, the nut is rejected. What is the longest and shortest length of the nut the machine will approve? Leave answer in millimeters. (1 centimeter = 10 millimeters)

3. You are having a birthday party at Jerry's Skating Rink for four of your friends. Two of your friends do not have their own roller blades and need to rent some for $7. If your total bill was $39, how much is it use the rink per person?