

RADICALS AND QUADRATICS SUMMARY

I. SIMPLIFYING VERSUS SOLVING RADICALS

- a. Remember that you *simplify* expressions and you *solve* equations. The difference between an expression and an equation is the equal sign!

SIMPLIFY:

$$8 + (-9)$$

$$-17$$

SOLVE:

$$x = 8 + (-9)$$

$$x = -17$$

Sometimes the answer is the same. Sometimes it is not!

With radicals, it isn't most times.

- b. When you *simplify* a radical, there is only one answer. However, when you *solve* a radical, you usually end up with two answers. This is because of the property where a negative \times a negative equals a positive, as well as a positive \times positive equals a positive.

SIMPLIFY:

$$\sqrt{144}$$

$$12$$

SOLVE:

$$x^2 = 144$$

$$x = \pm\sqrt{144}$$

$$x = \pm 12$$

NOTE: If you are solving an equation, be sure to add the \pm in front of the radical when solving. Expression? DON'T!

II. GRAPHING QUADRATIC EQUATIONS:

Standard Form of a Quadratic Equation: $y = ax^2 + bx + c; a \neq 0$

When graphed: forms a parabola.

PROPERTIES of the equation:

If $a > 0$, the parabola opens upward

If $a < 0$, the parabola opens downward

The greater the value of a , the wider the parabola.

$$x_0 = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$y_0 = c$$

vertex: $\left(\frac{-b}{2a}, y\right)$ (known as either a maximum or minimum point):

{to find the y value, substitute the $\frac{-b}{2a}$ into the equation for x and solve for y .}

Axis of Symmetry: $x = \frac{-b}{2a}$; vertical line through the vertex

Point of Symmetry to the y -intercept: replace the y -intercept value into the quadratic equation and solve for x . You will end up with two values for x ; $x = 0$ and the other value is the x value to the point of symmetry, the y -value is the y -intercept.