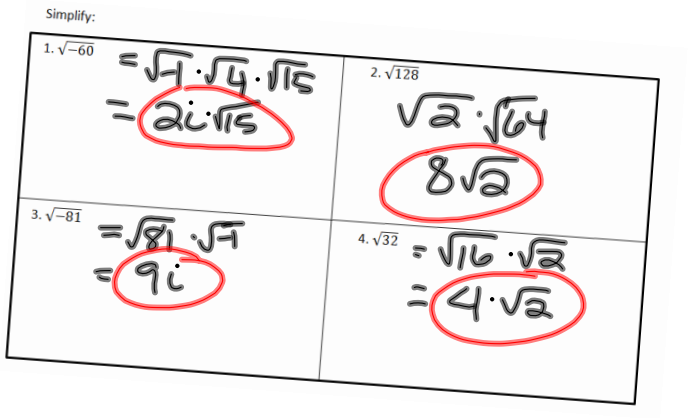
Round Table Activity



5.2L Solving Quadratic Equations Using the Quadratic Formula to Find Real Solutions

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Section 5.2L

Is it factorable?

To determine if a quadratic equation is factorable, find the value of the discriminant.

- If the **discriminant** is a **perfect square number OR zero**, then the quadratic equation **is factorable**
- If the **discriminant** is **not a perfect square number OR negative**, then the quadratic equation **is not factorable.**

The Quadratic Formula

Let a, b, and c be real numbers such that $a \neq 0$. The solutions of the quadratic equation $ax^2 + bx + c = 0$ are:

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

disc

Is it factorable?

To determine if a quadratic equation is factorable, find the value of the discriminant. ex) 1, 4, 9, . . .

- If the **discriminant** is a **perfect square number OR zero**, then the quadratic equation **is factorable**
- If the **discriminant** is **not a perfect square number OR negative**, then the quadratic equation **is not factorable.**

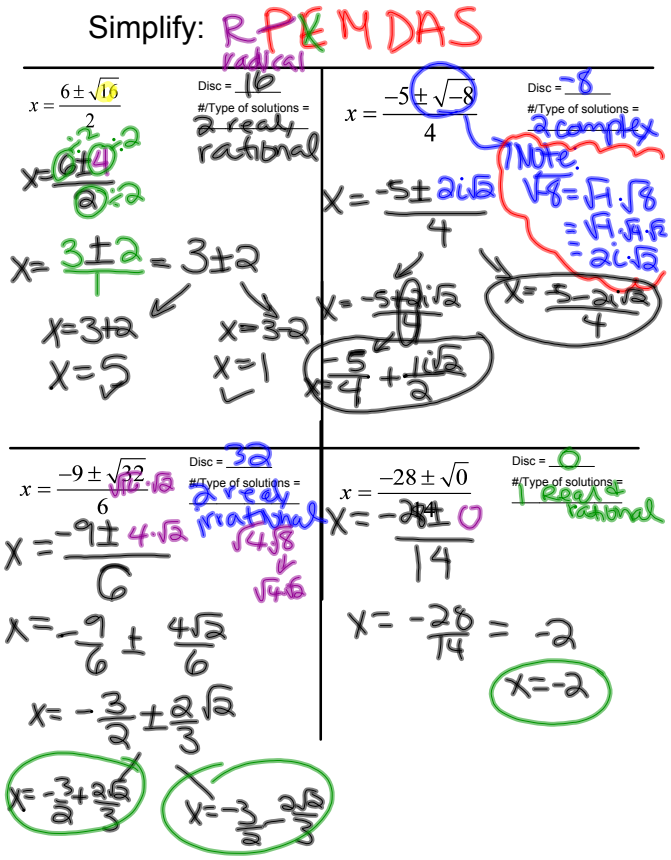
DISCRIMINANT: $b^2 - 4ac$

The discriminant determines the number and type of solutions of any quadratic (remember to set the equation = 0 first).

What is a solution/root/zero?_____

Discriminant	# of roots	types of roots
-Positive	**2**	**real**
(if the discriminant is a perfect square the roots are rational and the equation can be factored...and if not a perfect square the roots are irrational)		
-Zero	**1**	**real**
(this is a called a double root...where the graph "bounces" off of the x-axis)		
-Negative	**0**	**real**
(no real roots means there must be 2 complex or imaginary)		

Simplify: PEMDAS



Use the quadratic formula to solve the following equation.

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1) Solve $9x^2 + 6x = 1$

$-1 \quad -1$

Step 1: Write the equation in standard form.

$9x^2 + 6x - 1 = 0$

Step 2: Identify the values of a, b and c.

$a = 9 \quad b = 6 \quad c = -1$

$b^2 - 4ac$

$(6)^2 - 4(9)(-1) = 36 - (-36)$

$= 36 + 36$

$= 72$

2 Real Irrational

Step 3: Substitute the values from **Step 2** into the quadratic formula and simplify.

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

$$x = \frac{-6 \pm \sqrt{72}}{18} \quad \sqrt{36} \cdot \sqrt{2}$$

$$x = \frac{-6 \pm 6\sqrt{2}}{18} \quad \div 6 \quad \div 6$$

$$x = \frac{-1 \pm 1\sqrt{2}}{3}$$

$$x = \frac{-1 + \sqrt{2}}{3} \qquad x = \frac{-1 - \sqrt{2}}{3}$$

#2 – 5: Use the quadratic formula to find the solutions to the following equations.

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4) $x^2 + 10x = -22$

Disc: 12

$x = -5 + \sqrt{3}$

$x = -5 - \sqrt{3}$

5) $2x + 9 = 7x^2$

Disc: 256

$x = -1$

$x = \frac{9}{7}$