

Name Key
8A; Algebra 1

Date _____
Period _____

Quadratic Formula Homework

1) What is the quadratic formula?

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

Solve the following using the quadratic formula

1) $x^2 - 5x + 4 = 0$

$a = 1$
 $b = -5$
 $c = 4$

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

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(4)}}{2(1)}$$

$$x = \frac{5 \pm \sqrt{25 - 4(1)(4)}}{2(1)}$$

$$x = \frac{5 \pm \sqrt{25 - 16}}{2}$$

$$x = \frac{5 \pm \sqrt{9}}{2}$$

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

$$x = \frac{5+3}{2} \quad | \quad x = \frac{5-3}{2}$$

$$x = \frac{8}{2} \quad | \quad x = \frac{2}{2}$$

$$x = 4 \quad | \quad x = 1$$

$\{1, 4\}$
2 real roots

2) $2x^2 - 3x = 7$
 $\quad \quad -7 \quad -7$

$2x^2 - 3x - 7 = 0$

$a = 2$
 $b = -3$
 $c = -7$

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

$$x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(2)(-7)}}{2(2)}$$

$$x = \frac{3 \pm \sqrt{9 - 4(2)(-7)}}{2(2)}$$

$$x = \frac{3 \pm \sqrt{9 + 56}}{4}$$

$$x = \frac{3 \pm \sqrt{65}}{4}$$

* can't reduce any further

$$x = \frac{3 + \sqrt{65}}{4} \quad | \quad x = \frac{3 - \sqrt{65}}{4}$$

$$x = \frac{3 \pm \sqrt{65}}{4}$$

2 real roots

$$3) 16x^2 + 8x + 1 = 0$$

$$a = 16$$

$$b = 8$$

$$c = 1$$

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

$$x = \frac{-(8) \pm \sqrt{(8)^2 - 4(16)(1)}}{2(16)}$$

$$x = \frac{-8 \pm \sqrt{64 - 4(16)(1)}}{2(16)}$$

$$x = \frac{-8 \pm \sqrt{64 - 64}}{32}$$

$$x = \frac{-8 \pm \sqrt{0}}{32}$$

$$x = \frac{-8 \pm 0}{32}$$

$$x = \frac{-8 + 0}{32}$$

$$x = \frac{-8}{32}$$

$$x = -\frac{1}{4}$$

$$x = \frac{-8 - 0}{32}$$

$$x = \frac{-8}{32}$$

$$x = -\frac{1}{4}$$

$$\left\{ -\frac{1}{4} \right\}$$

1 real root

$$4) x^2 + 4x + 5 = 0$$

$$a = 1$$

$$b = 4$$

$$c = 5$$

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

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(5)}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{16 - 4(1)(5)}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{16 - 20}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-4}}{2}$$

Can't simplify

$$x = \frac{-4 + \sqrt{-4}}{2}$$

$$x = \frac{-4 - \sqrt{-4}}{2}$$

$$x = \frac{-4 \pm \sqrt{-4}}{2}$$

NO real roots b/c it's imaginary