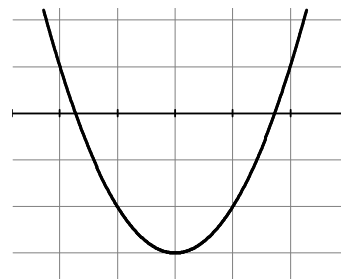


Write your questions
and thoughts here!**Notes****The Quadratic Formula**

If you have a quadratic equation in the form $ax^2 + bx + c = 0$, then you can use the quadratic formula to solve for x .

$$x =$$

Sometimes finding the zeros through factoring is not possible, or it is just too hard! The quadratic formula makes it much easier. It is one more “tool” in your toolkit for solving quadratic equations.

**Analysis of the Quadratic Formula**

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

What does $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ represent?

What does $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ represent?

Examples:

1. $x^2 - 8x + 15 = 0$

2. $r^2 = 3 - 2r$

3. $22n^2 - 21 = 12n^2 + n$

Write your questions
and thoughts here!

For 4-5, give the EXACT and the ROUNDED answers to two decimal places.

4. $x^2 + 3 = -5x$

EXACT:

ROUNDED:

5. $7w^2 - 2w - 10 = 4$

EXACT:

ROUNDED:

WARNING! Common Mistakes:

1. Forget to take the OPPOSITE of b .
2. Incorrectly square b when it's negative.
3. Forget to multiply by negative if a or c is negative. $b^2 - 4ac$ becomes $b^2 + 4ac$.

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

11.3 The Quadratic Formula

Algebra 1

Name: _____

Practice

Solve each equation using the quadratic formula.

1. $v^2 + 3v - 18 = 0$

2. $2k^2 + 2 = 2k$

3. $2x^2 - 2x - 4 = 0$

$$4. 5r^2 + 5r - 67 = -7$$

$$5. 6x^2 - 13x - 69 = 3 - 7x$$

$$6. 4b^2 + 6b - 30 = -12$$

$$7. x^2 - 6x + 3 = -4x^2$$

$$8. 2n^2 - 7n - 4 = 5$$

$$9. 6g^2 - 7g - 88 = 10$$

$$10. -6n^2 - 17n + 21 = -9 - 7n^2$$

$$11. 10x^2 + 10x - 8 = 8x - 5x^2$$

Solve each equation using the quadratic formula. Give your answers in both EXACT (simplified radical) and DECIMAL (round to the nearest hundredth).

12. $5x^2 - 5x = -1$

EXACT:

ROUNDED:

13. $-7x^2 + 1 = -3x$

EXACT:

ROUNDED:

14. $11x^2 - 6x - 3 = 6x^2$

EXACT:

ROUNDED:

15. $3r^2 + 6r - 4 = -r^2 + 5$

EXACT:

ROUNDED:

16. Find the vertex of
 $f(x) = -x^2 + 8x - 6$

17. Solve by **factoring**.
 $x^2 + 5x - 36 = 0$

18. Use the function to evaluate.
 $f(x) = \begin{cases} 4x^2 - 1, & x \leq -2 \\ -x, & x > -2 \end{cases}$

a. $f(0) =$ b. $f(5) =$

c. $f(-2) =$ d. $f(-3) =$

11.3 The Quadratic Formula

Practice check: The next two questions are just like the practice, but we provide no answers. If you can't do these problems, then you're definitely not ready for a Mastery Check!

19. Solve with the quadratic formula.

$$3b^2 - 5b - 23 = 5$$

20. Solve with the quadratic formula.

$$2k^2 + 2k - 9 = 0$$

21. Mr. Kelly hits a baseball straight up into the air with an initial velocity of 93 feet per second. The height of the ball (in feet) can be modeled by $h(t) = -16t^2 + 93t + 3$ where t is the number of seconds after the ball made contact with the bat.

a. Using the quadratic formula, how long does it take the ball to hit the ground? (Round to the nearest hundredth and use correct units.)

b. Using the quadratic formula, when will the ball reach a height of 130 feet? (Round to the nearest hundredth and use correct units.)

c. Find $h(4)$. What does it mean in the context of this problem?

d. Is the ball on the way up or down at $h(4)$?