

4-7 Quadratic Formula

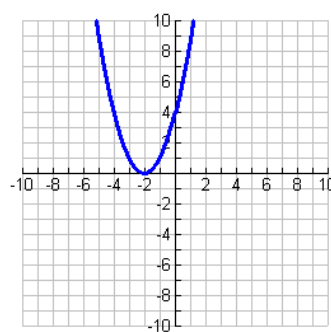
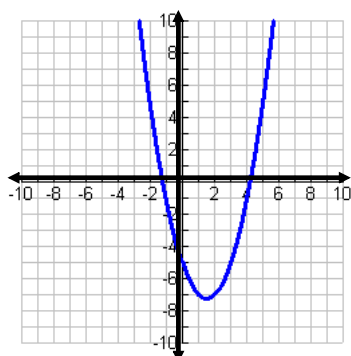
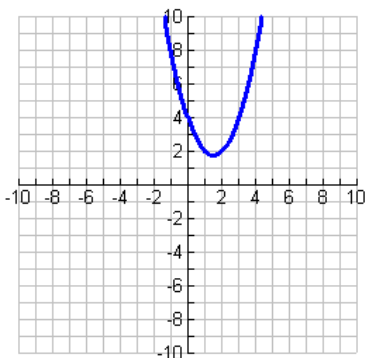
Used to solve ANY quadratic equation

~ What are previous methods?

~ What other method can be used?

Solutions to a Quadratic Equation

Solutions to any equation when set equal to zero are the x -intercepts.



Drag to the correct graph:

2 Real Solutions

1 Real Solution

2 Complex Solutions

The quadratic formula is derived from $ax^2 + bx + c = 0$ using completing the square.

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

The Discriminant

$b^2 - 4ac$

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

$b^2 - 4ac > 0$, you'll get 2 real solutions;
2 x -intercepts

$b^2 - 4ac = 0$, you'll get 1 real solution; 1 x -intercept

$b^2 - 4ac < 0$, you'll get 2 complex solutions; no x -intercept

Find the discriminant and use it to describe the solution set.

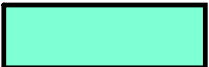
$$x^2 + 10x + 25 = 0$$

Find the discriminant and use it to describe the solution set.

$$-2x^2 + 4x = 20$$

Solve using the quadratic formula.

$$x^2 + 6x = 5$$

$$-3 \pm \sqrt{14}$$


Solve using the quadratic formula.

$$2x^2 + 3x = 4$$



*Celebrate your new found
knowledge by practicing with:*

p. 244 #1-10

DO NOT LEAVE 8-10 BLANK!!!

CELEBRATE

Do you know **HOW?**

Solve each equation using the Quadratic Formula.

1. $x^2 - 5x - 7 = 0$

2. $x^2 + 3x - 13 = 0$

3. $2x^2 - 5x - 3 = 0$

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

Find the discriminant of each quadratic equation.




Determine the number of real solutions.

5. $-x^2 + 2x - 9 = 0$

6. $x^2 + 17x + 4 = 0$

7. $x^2 - 6x + 9 = 0$

Do you **UNDERSTAND?** **MATHEMATICAL PRACTICES**

-  **8. Reasoning** For what values of k does the equation $x^2 + kx + 9 = 0$ have one real solution? two real solutions?
-  **9. Error Analysis** Your friend concluded that because two discriminants are equal, the solutions to the two equations are the same. Explain your friend's error. Give an example of two quadratic equations that disprove this conclusion.
-  **10. Reasoning** If one quadratic equation has a positive discriminant, and another quadratic equation has a discriminant equal to 0, can the two quadratic equations share a solution? Explain why or why not. If so, give two quadratic equations that meet this criterion.