

Warm-Up  
**Work on your Warm-up**



2.  $y = 5x^2 - x - 4$

Solve by grouping:

Solve by Completing the Square:

## **Agenda:**

**1) Quadratic formula! - What is it and how do we use it?**

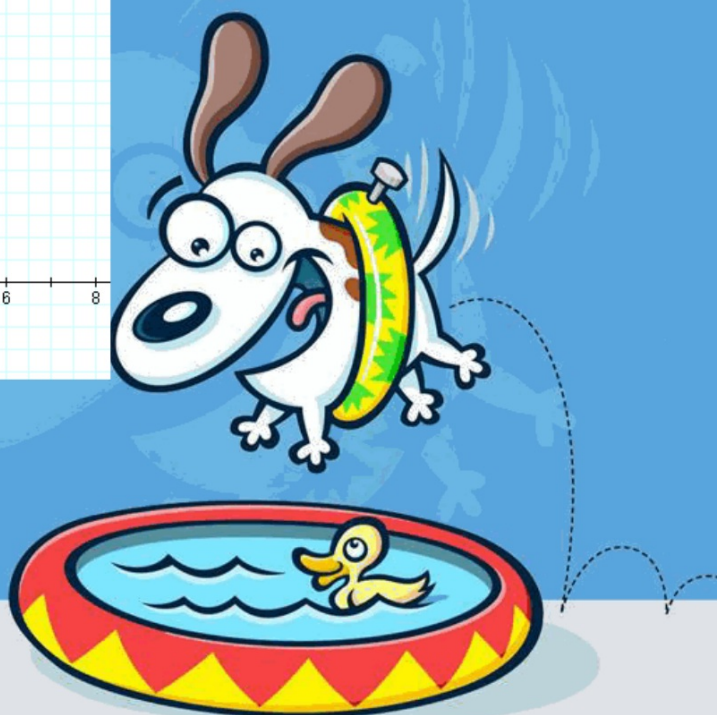
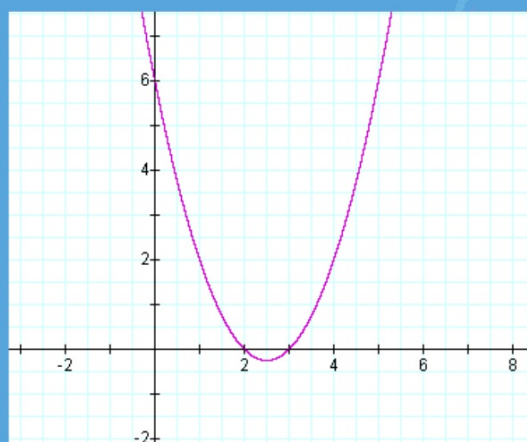
**2) Mastery Challenge!**

**3) Factoring and coloring activity.**



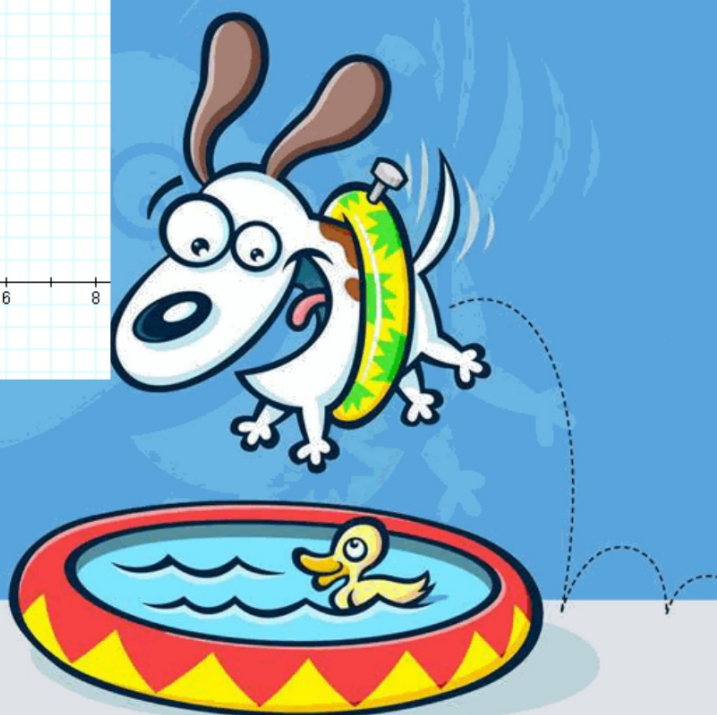
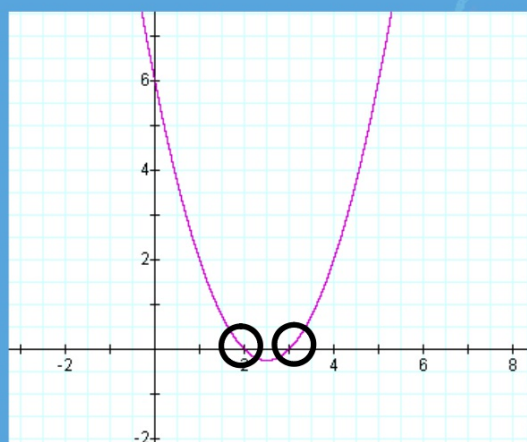


Remember you are trying to find **SOLUTIONS**  
to a Quadratic





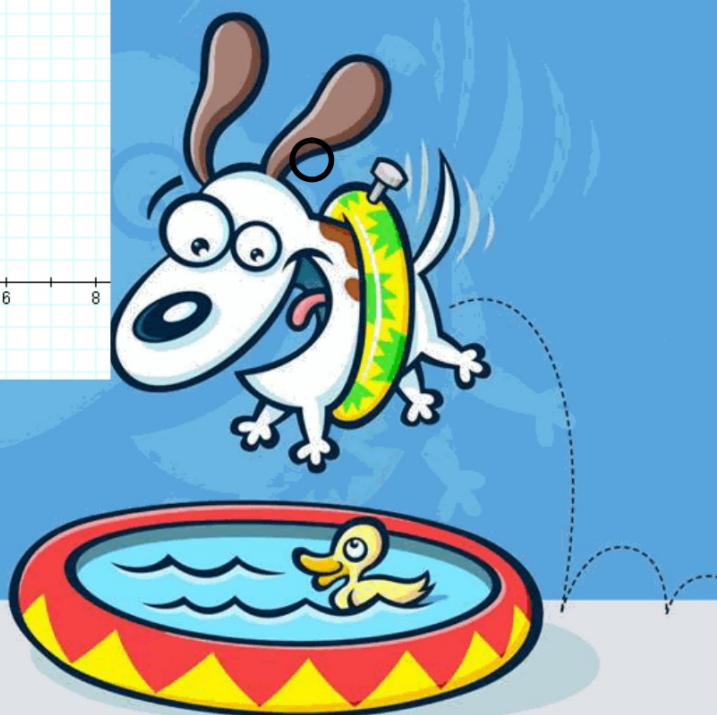
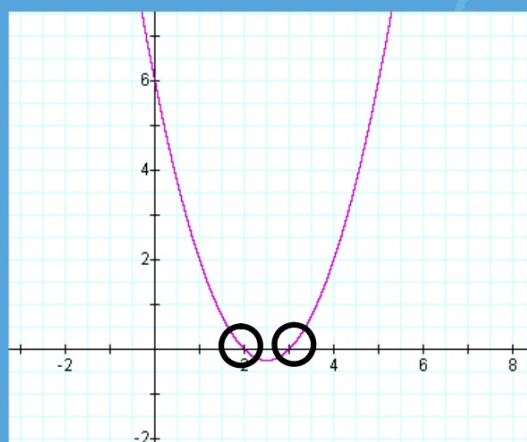
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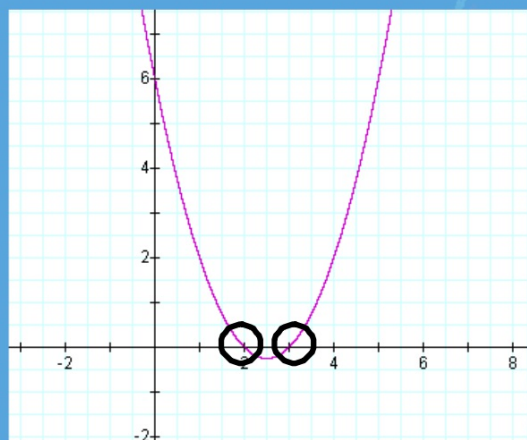
The solutions are the x intercepts of  
a Quadratic Graph!!!





Remember you are trying to find **SOLUTIONS**  
to a Quadratic

The solutions are the x intercepts of  
a Quadratic Graph!!!



**These all mean the  
same thing!**

Solutions  
X intercepts  
Roots  
Zeros





Instead of Completing the Square, we have proved that all Quadratics can be solved by using the Quadratic Formula.

$$x = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$





## Steps for Using the Quadratic Formula

1) Standard Form:  $f(x) = Ax^2 + Bx + C$

2) On the x axis the y value is zero.

Replace the  $f(x)$  with zero.

$$Ax^2 + Bx + C = 0$$

3) Identify A, B and C

4) Substitute into the Quadratic Formula

$$x = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$

### Discriminant

### 5) Simplify

Do you see  $b^2 - 4ac$  in the formula above? It is called the **Discriminant**, because it can "discriminate" between the possible types of answer:

- when  $b^2 - 4ac$  is positive, we get two [Real](#) solutions
- when it is zero we get just ONE real solution (both answers are the same)
- when it is negative we get two [Complex](#) solutions



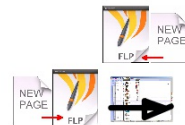




Which expression could you use to solve

$$3x^2 + 2x + 7 = 0?$$

**Write the Quadratic Formula  
when you see a Quadratic  
Expression**





Solve by Using the Quadratic Formula

$$f(x) = 3x^2 - 7x$$

A	B
C	D

$$\left\{ \frac{\pm\sqrt{21}}{3} \right\}$$

No Solution

$$\left\{ 0, \frac{7}{3} \right\}$$

$$\left\{ -\frac{7}{3}, 0 \right\}$$





Solve by Using the Quadratic Formula

$$f(x) = -3x^2 - 6x - 7$$

A

No Solution

B

$$\left\{ \frac{-3 \pm \sqrt{30}}{3} \right\}$$

C

$$\left\{ \frac{3 \pm \sqrt{30}}{3} \right\}$$

D

$$\left\{ \frac{-3 \pm \sqrt{177}}{12} \right\}$$



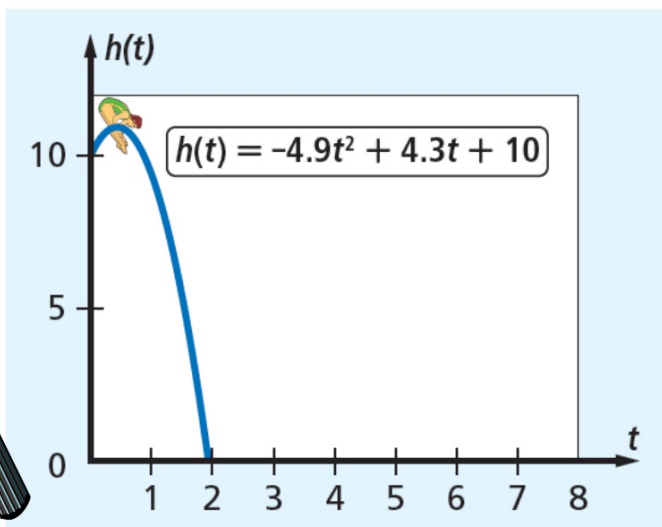
# Application

Solve the following question using the quadratic formula.



Use the magnifying glass to reveal the answer below the graph.

Izaiah is on a 10-meter platform diving, the function  $h(t) = -4.9t^2 + 4.3t + 10$  gives the approximate height,  $h(t)$ , above the water in meters Izaiah is at  $t$  seconds after launching into the dive if he jumps upward at an initial velocity of 4.3 meters per second. When the Izaiah hits the water,  $h(t)$  is zero. To the nearest tenth, how many seconds elapse from the time the Izaiah leaves the 10-meter platform until the diver hits the water?



# Application

Solve the following question using the quadratic formula.



President Trump visits Carowinds and decided to ride the Intimidator. The rollercoaster that he is on is represented by the quadratic function  $f(x) = -3x^2 + 18x - 4$ , where  $f(x)$  represents the height in kilometers (km) and  $x$  represents time. At what time is President Trump located at ground level? How long is the roller coaster ride?

Use the magnifying glass to reveal the answer below the graph.



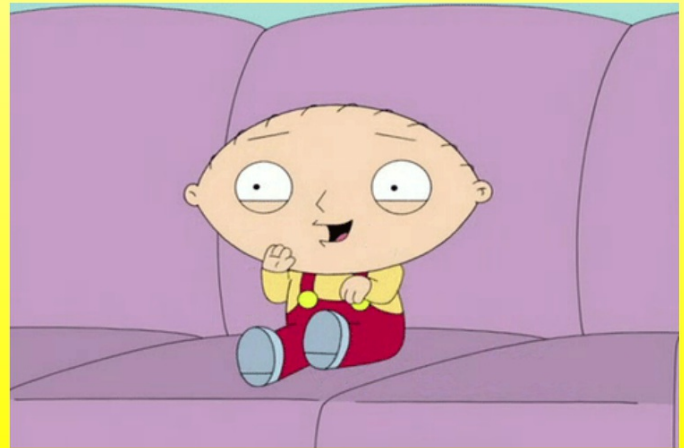


Solve by Using the Quadratic Formula

$$f(x) = x^2 - 5x - 6$$

## **Mastery Challenge!**

**35 minutes. Individual. Solutions are at the front!  
Use the quadratic formula!**



# Closure:

- Quadratic Formula Worksheet is due tomorrow. Make sure to **SHOW ALL WORK.**
- *Have a GREAT rest of the day!*





# Exit Ticket



Solve #6 by Completing the Square. Solve #7 by Quadratic Formula

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

7.  $x^2 + 4x = 21$



## Factoring / Coloring

- Till end of the class.
- Group work (2-3 max. group)
- Solve the *left side* with the **any** factoring method.
- Solve the *right side* with the **quadratic formula**.
- If you do not finish, this will be homework.
- Once you're finished, turn it in and let Mr. Kim know.

