

## NOTES: Section 9.7 – Using the Discriminant

Goals: #1 - I can use the discriminant to determine the number of solutions of a quadratic equation.

*Homework: Section 9.7 Worksheet*



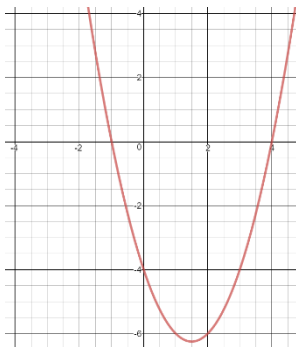
**Warm Up:** Use the quadratic formula to solve the equation. Write your answer in simplest radical form.

1.  $4x^2 - 8x = -3$

**Exploration #1:** Work with a partner and answer the following questions.

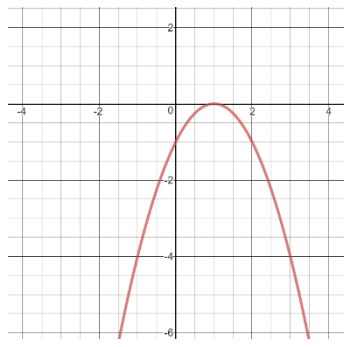
1. Use the graph to identify the solutions of the quadratic equation:

a.  $y = x^2 - 3x - 4$



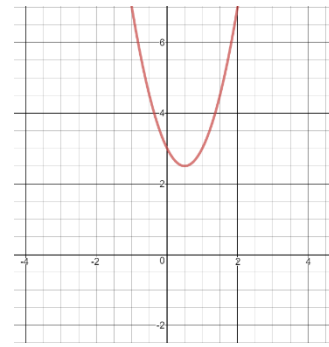
solution/s: \_\_\_\_\_

b.  $y = -x^2 + 2x - 1$



solution/s: \_\_\_\_\_

c.  $y = 2x^2 - 2x + 3$



solution/s: \_\_\_\_\_

2. Find the value of  $b^2 - 4ac$  for these quadratic equations:

a.  $y = x^2 - 3x - 4$

b.  $y = -x^2 + 2x - 1$

c.  $y = 2x^2 - 2x + 3$

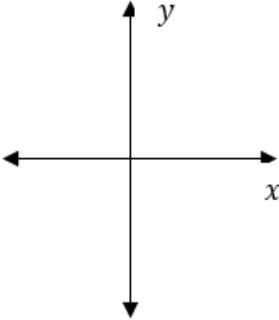
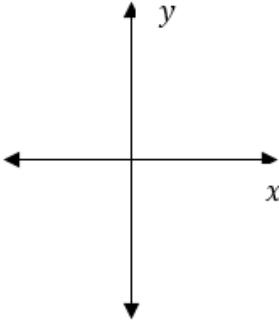
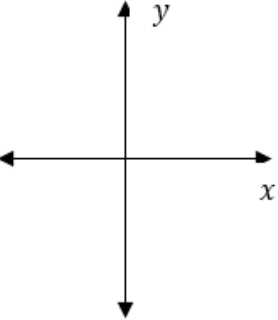
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**Notes:**

In the quadratic formula, the expression \_\_\_\_\_ is called the \_\_\_\_\_ of the quadratic equation.

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

We can use the \_\_\_\_\_ of a quadratic equation to determine the equation's \_\_\_\_\_ and \_\_\_\_\_ of \_\_\_\_\_.

<b>Value of discriminant</b>			
<b>Number and type of solutions</b>			
<b>Graph of <math>y = ax^2 + bx + c</math></b>			

**Example #1:** Find the value of the discriminant. Then use the value to determine whether the equation has *two solutions*, *one solution*, or *no real solution*.

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

2.  $2x^2 = 8x - 8$

3.  $x^2 - 5x + 4 = 0$

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**You practice:** Find the value of the discriminant. Then use the value to determine whether the equation has *two solutions*, *one solution*, or *no real solution*.

1.  $x^2 + 3 = 0$

2.  $x^2 - 6x = 13$

3.  $x^2 - 2x + 1 = 0$