Name: _____ Date: _____ IB Math A&A SL

Lesson 2.3 – Analyzing Graphs of Quadratic Functions, Using the Discriminant
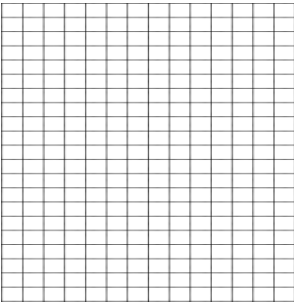
I. **Warm-Up**
1. Graph the function $f(x) = x^2 + 8x + 19$ on your calculator. Are there any zeroes?

2. Solve the equation below: (*Complete the square or use the quadratic formula*).
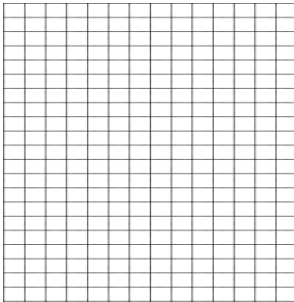$-2x^2 - 12x - 19 = 0$

II. **Using the Discriminant**
3. For each of the following, use the quadratic formula to find the roots of the equation. What do you notice about the value under the square root?
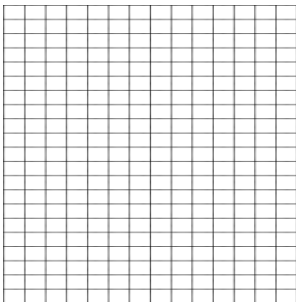
$y = x^2 - 2x - 3$	$y = x^2 - 2x + 1$	$y = x^2 - 2x + 3$

The Discriminant:

(The value underneath the square root in the quadratic formula will tell the number of real solutions to the quadratic equation.)

$b^2 - 4ac > 0$

$b^2 - 4ac = 0$

$b^2 - 4ac < 0$

4. Use the discriminant to determine the relationship between each function and the x-axis. State how many zeroes each function will have.

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

    b. $y = -2x^2 + 5x + 1$

5. Find the values of k for which the function $y = x^2 - 6x + k$.

a. Crosses the x-axis twice

b. Touches the x-axis once

c. Does not cross the x-axis