Today's Learning Goal(s):

Date: _____

By the end of the class, I will be able to:

a) classify the nature of the roots of a quadratic equation using the discriminant.

b) use the discriminant in problem solving situations.

Links

Last day's work:

pp. 177-178 #1ac, 2ac, 4ace, 5, 6ac, 9, 10, 13

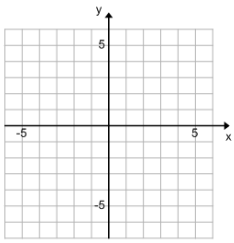
3.6 The Zeros of a Quadratic Function

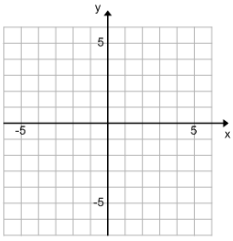
Date: _____

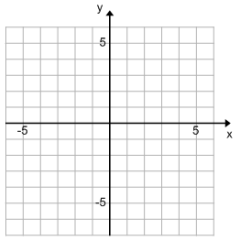
Ex. 1: Find the zeros of the following using the quadratic formula.

a) $f(x) = 2x^2 - 5x - 3$ b) $g(x) = 2x^2 - 12x + 18$ c) $h(x) = 2x^2 - 4x + 5$

click on the graphs







The Discriminant

For $ax^2+bx+c=0$ or for $f(x)=ax^2+bx+c$

If $b^2-4ac>0$, there are 2 solutions/zeros.

If $b^2-4ac=0$, there is 1 solution/zeros.

If $b^2-4ac<0$, there are no solutions/zeros.

Ex. 2: Determine the number of zeros for $f(x)=-3x^2+6x-3$

What is the "nature of the roots" for $0=-3x^2+6x-3$?

Ex. 3: For what values of k will the function $f(x)=2x^2+4x+k$ have:

a) 1 zero? b) 2 zeros? c) no zeros?

Inequality Rules?

Ex. 4: For what value(s) of k will the function $g(x) = kx^2 + 8x + k$ have no real roots?

$$b^2 - 4ac < 0$$
$$8^2 - 4(k)(k) < 0$$
$$64 - 4k^2 < 0$$
$$-4(k^2 - 16) < 0$$
$$-4(k+4)(k-4) < 0$$

Think: for LS <0, then both brackets must be positive. So, what value(s) of k will make the brackets positive.

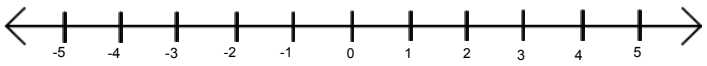
For k+4>0 then k>−4
For k−4>0, then k>4

OR

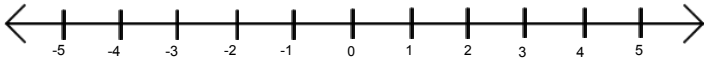
For k+4<0 then k<−4
For k−4<0 then k<4

Since both brackets have to be positive or negative AT THE SAME TIME, then the value(s) of k have to "work" for both brackets. This is easiest to see on a number line.

Both pos:



Both neg:



∴ if k>4 **or** k<−4, the function will have no real roots.

Are there any Homework Questions you would like to see on the board?

Last day's work:

pp. 177-178 #1ac, 2ac, 4ace, 5, 6ac, 9, 10, 13

Today's Homework Practice includes:

pp. 185-186 #1bde, 3ac, 4ac, 6, 7 [14,17,18]