The Discriminant

Thursday, January 19, 2012
5:37 PM
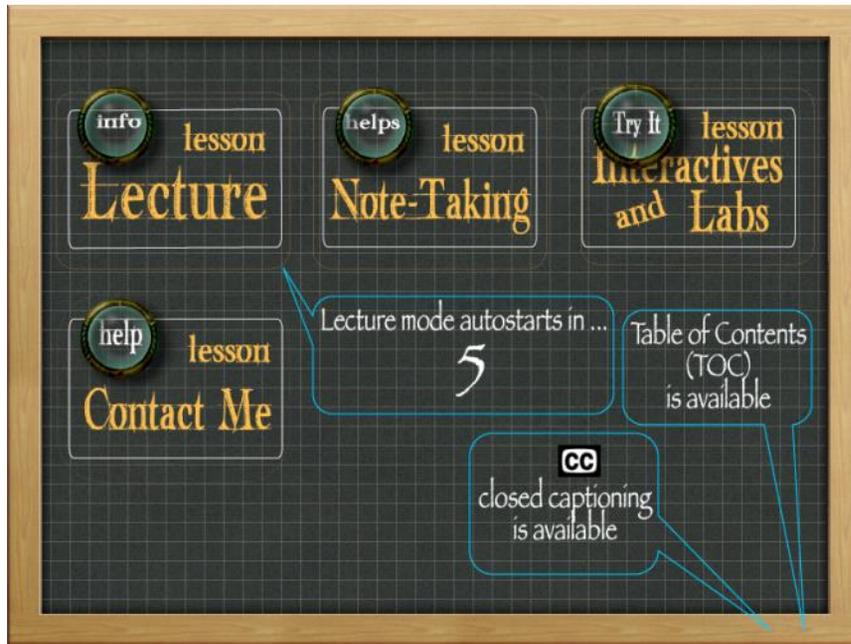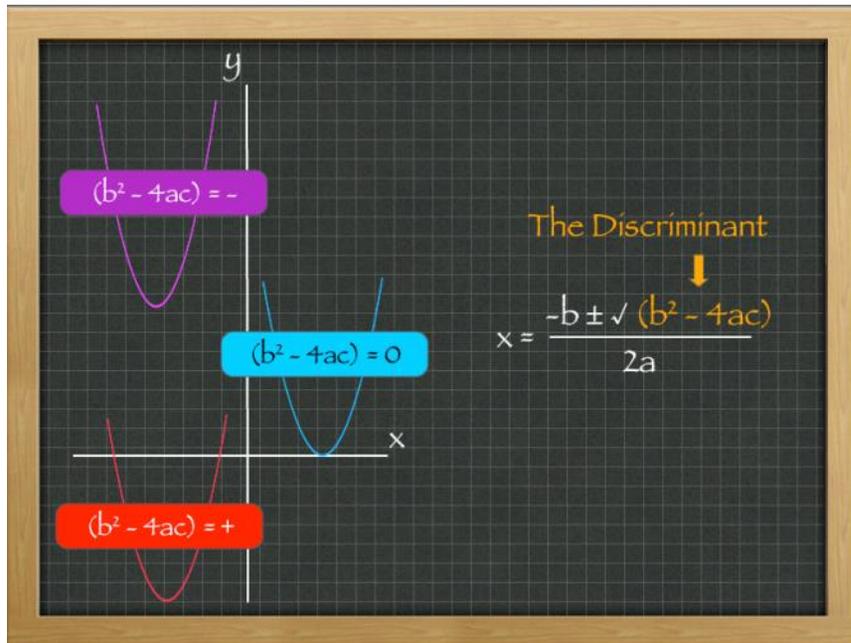
| Slides	Notes
	When we discussed the quadratic equations, we discussed how the roots of the equation that you are looking for, or the x, is where the parabola crosses the x axis when it is graphed. You learned that it could cross the x axis in two places, one place, or none at all if the vertex is above the x-axis altogether. If it is above the line, you could say it has no solutions or if you have been introduced to complex numbers, those are the ones that will have the italic letter "I", you have a complex root. You don't have to solve the whole quadratic equation though to know which situation you have. The part of the quadratic equation that is under the radical is all you need to solve for to have that information. This part of the equation is called the discriminant. Just put your equation in to standard form and plug into the discriminant the a, b, and c and solve it. If the answer is a positive number, you will have two roots and neither will have imaginary numbers. If the answer is zero, then the vertex is right on the x-axis and it will have only one root where it touches it. If the answer is a negative number it will never cross the x-axis. That actually should make sense to you if you think about it. If you have a negative number under the radical sign, you end up with an imaginary

number in order to track the negative sign. Imaginary numbers cannot be graphed just as you cannot find any place that the parabola crosses the x-axis.

Try It

Drag and drop: What belongs together? $(b^2 - 4ac)$
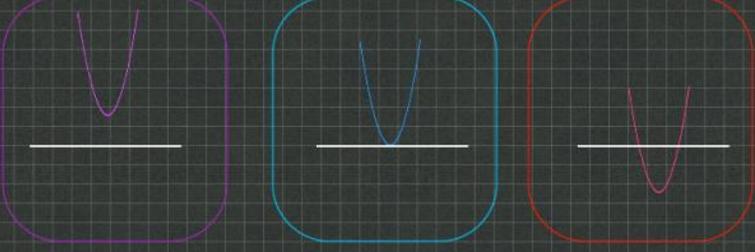
negative

positive

zero

Submit

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

$x^2 + 6x + 5 = 0$

$x^2 - 3x + 10 = 0$

Congratulations!
You have completed this topic

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help   lesson

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