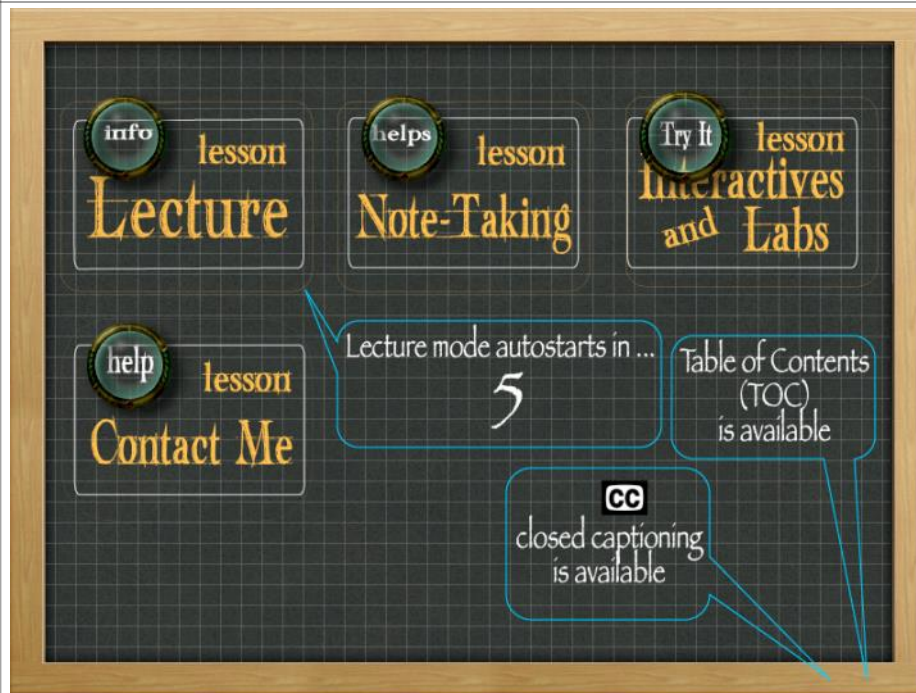


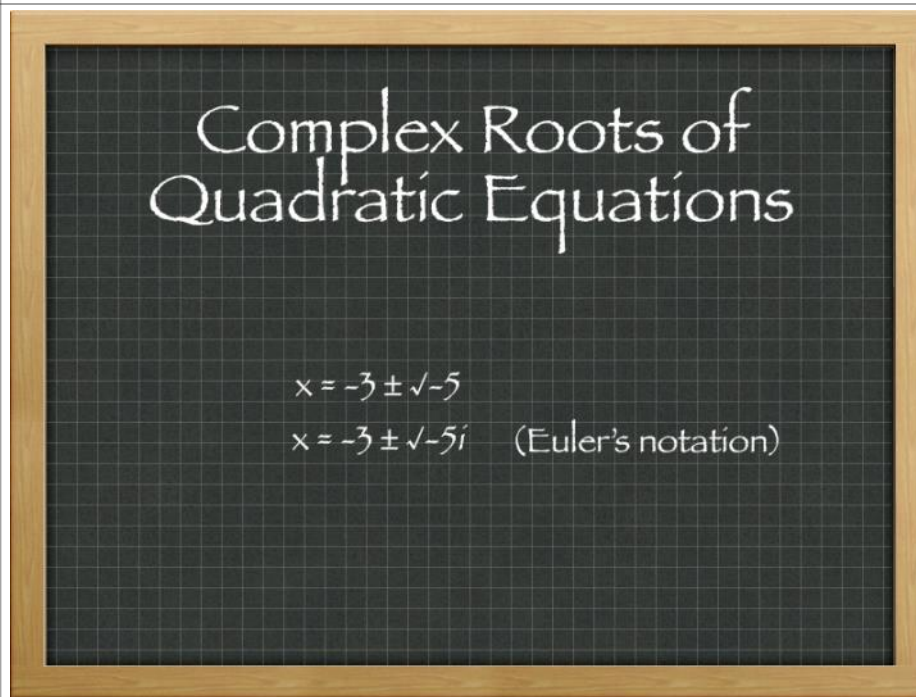
Complex Roots of Quadratic Equations

Thursday, January 19, 2012
5:17 PM

Slides



Notes



In this lesson you will be combining several things that you have learned so far including completing the square, how to handle coefficients, and what to do when there is a negative number as a root in your answer. You won't really be learning any new skill, just putting it all together.

To prepare, let's remember that when you have a negative number under the root sign, it is easy to lose the information that there ever was a negative number, so Euler came up with this notation system to be able to track it so it wouldn't be lost. We can think of it as being equivalent to a negative 1. So that negative 5 will become the square root of 5i.

Since we don't have a new skill in this lesson, try the next problem on scratch paper and check your answer

to see if it is correct. You will be able to see the answer and the worked problem when you click on the box.

$$\begin{aligned} -2x + 5x^2 &= -3 \\ 5x^2 - 2x + 3 &= 0 \\ \frac{5x^2}{5} - \frac{2x}{5} + \frac{3}{5} &= \frac{0}{5} \\ x^2 - \frac{2}{5}x + \frac{3}{5} &= 0 \\ \left(x^2 - \frac{2}{5}x\right) &= -\frac{3}{5} \\ \left(x^2 - \frac{2}{5}x + \frac{1}{25}\right) &= -\frac{3}{5} + \frac{1}{25} \\ \left(x - \frac{1}{5}\right)^2 &= -\frac{14}{25} \\ x - \frac{1}{5} &= \sqrt{-\frac{14}{25}} \\ x &= \frac{1}{5} \pm \frac{\sqrt{14}}{5}i \end{aligned}$$

Left side of the chalkboard (boxed):

$$\left(-\frac{2}{5}, \frac{1}{2}\right)^2$$
$$\left(-\frac{2}{10}\right)^2$$
$$\left(-\frac{1}{5}\right)^2$$
$$\frac{1}{25}$$

Congratulations!
You have completed
this topic

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