TOPIC 11 Zeros of Poly, Part 1

Oct 3 - 9:20 AM

Oct 3 - 9:23 AM

Oct 3 - 9:24 AM

Oct 3 - 9:31 AM

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1. Adding Complex numbers:

\[
\begin{align*}
2 + 3i & + (-1 - 3i) \\
1 + 0i
\end{align*}
\]

\[
\begin{align*}
(2 - i)(3 + i) & \\
6 + 2i - 3i & - i^2 \\
6 - i + 1 & 7 - i
\end{align*}
\]

2. Multiplying complex numbers:

\[
\begin{align*}
\text{Conjugate of the} & \frac{2 - i}{3 + 2i} \text{ denominator.} \\
\text{Conjugate of} & a + bi \Rightarrow a - bi \\
5 - i & 5 + i \\
9 + 4 & 4 + 7i \\
13 & 13
\end{align*}
\]

3. Dividing complex numbers:

\[
\begin{align*}
\text{Conjugate of the} \frac{2 - i}{3 + 2i} & \text{ denominator.} \\
\text{Conjugate of} & a + bi \Rightarrow a - bi \\
5 - i & 5 + i \\
9 + 4 & 4 + 7i \\
13 & 13
\end{align*}
\]

4. Extraneous solutions: Even and odd multiplicity:

- \(x = a\) is a zero of even multiplicity of \(f(x)\) if \(a\) is a factor of \(f(x)\) and \(n\) is even.
- \(x = a\) is a zero of odd multiplicity of \(f(x)\) if \(a\) is a factor of \(f(x)\) and \(n\) is odd.
Recall example 3. The solutions to \( x^3 - 2x^2 + 6x - 8 = 0 \) are \( x = -2, 1, 4 \).

If \( f(x) = x^2 - 3x + 2 \) then what does the graph of \( f(x) \) look like at \( x = 0 \)?

If \( x = a \) is a zero of even multiplicity then what does the graph do at \( x = a \)?

If \( x = a \) is a zero of odd multiplicity then what does the graph do at \( x = a \)?