# 9.3 Complex Zeros 

- I can find all complex zeros when given a real zero
- I can use synthetic division to find complex zero

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Find all zeros given one real zero

$$
\begin{aligned}
& f(x)=3 x^{3}-17 x^{2}+33 x-22 ; 2 \\
& 2 \left\lvert\, \begin{array}{cccc}
3 & -17 & 33 & -22 \\
\downarrow & 6 & -22 & 22 \\
3 & -11 & 11 & (O R
\end{array}\right. \\
& 3 x^{2}-11 x+11 \quad a=3 \\
& \begin{array}{ll}
11 \pm \sqrt{\sqrt{121}-\sqrt{132}} & b=-11 \\
6 & c=11
\end{array} \\
& 2, \frac{11+i \sqrt{11}}{6}, \frac{11-i \sqrt{11}}{6}
\end{aligned}
$$

Find all zeros given one real zero

$$
\begin{aligned}
& f(x)=3 x^{3}+16 x^{2}+9 x-36 ;-3 \\
& -3 \int^{3169-36} \\
& 3 x^{2}+7 x-12 \\
& \text { zeros: }-3, \frac{-7 \pm i \sqrt{95}}{6} \\
& (x+3)(x+7)(x-))
\end{aligned}
$$

Write a 2nd degree polynomial in factored form with the following zeros

$$
\begin{gathered}
1+2 i, 1-2 i \\
(x-(1+2 i))(x-(1-2 i)) \\
(x-1-2 i) \quad \begin{array}{c}
2-2 \\
(x-2)(x+2)
\end{array}
\end{gathered}
$$

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## Write a 3rd degree polynomial in factored form with the following zeros

$$
(x-1)(x-3 i)(x+3 i)
$$

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# Write a 3rd degree polynomial in factored form with the following zeros 

$$
-2,1+2 i, 1-2 i
$$

