

12) -2 and $1+2i$ and $1-2i$

$$(x+2)(x-(1+2i))(x-(1-2i))$$

$$(x+2)(x-1-2i)(x-1+2i)$$

$$\begin{array}{r} x^2 - x + 2xi \\ -x \quad + 1 - 2i \\ \hline -2xi + 2 + 7i - 4i^2 \\ \quad \quad \quad + 9 \end{array}$$

$$(x+2)(x^2 - 2x + 5)$$

$$x^3 + x + 10$$

27) $x^3 + 4x - 5$

$$\frac{\pm 1, \pm 5}{\pm 1} \quad \pm 1, \pm 5$$

$$\begin{array}{r} 1 \mid 1 \quad 0 \quad 4 \quad -5 \\ \quad \downarrow \quad 1 \quad 1 \quad 5 \\ \hline 1 \quad 1 \quad 5 \quad 0 \end{array}$$

Zeros: $x=1, -\frac{1}{2} \pm \frac{i\sqrt{19}}{2}$

$$(x-1)(x^2+x+5)$$

x-int: 1

$$(x-1)\left(x - \left(\frac{-1 \pm i\sqrt{19}}{2}\right)\right)$$

$$(x-1)\left(x + \frac{1}{2} - \frac{i\sqrt{19}}{2}\right)\left(x + \frac{1}{2} + \frac{i\sqrt{19}}{2}\right)$$

14) -1 mult 3, 3 mult 1

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

$$(x+1)(x+1)(x+1)(x-3) = x^4 - 6x^2 - 8x - 3$$

33) 1+i f(x) = x^4 - 2x^3 - x^2 + 6x - 6

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

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

$$\begin{array}{r} x^2 - x + xi \\ -x \quad +1 - i \\ -xi \quad +i - i^2 \\ \hline x^2 - 2x + 2 \end{array}$$

$$\begin{array}{r} x^2 - 3 \\ x^2 - 2x + 2 \overline{) x^4 - 2x^3 - x^2 + 6x - 6} \\ \ominus x^2 - 2x^3 + 2x^2 \quad \downarrow \downarrow \\ -3x^2 + 6x - 6 \\ \ominus -3x^2 + 6x + 6 \\ \hline -0x - 0 \end{array}$$

$$(x^2 - 2x + 2)(x^2 - 3)$$

$$x = 1 \pm i$$

$$x = \pm \sqrt{3}$$

zeros

Formalize LF

$$(x + \sqrt{3})(x - \sqrt{3})(x - 1 + i)(x - 1 - i)$$

Study for Quiz on 2.3-2.5

2.5 #15, 29, 31, 34, 36

2.4 #22, 28, 35, 38, 44, 51

2.3 #17, 37, 42, 54