

TEST 3, wed, Oct 28<sup>th</sup>

§3.3 #43 (#8 on the MyLab)

$i$  &  $1+i$  are zeros. Build the polynomial

$$\boxed{(x-i)(x-(-i))(x-(1+i))(x-(1-i))} \rightarrow \text{stop here on test.}$$

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

$$= (x^2+1)(x^2 - x + ix - x + 1 - i - ix + i - i^2)$$

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

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

$$= x^4 - 2x^3 + 2x^2 + x^2 - 2x + 2$$

$$= x^4 - 2x^3 + 3x^2 - 2x + 2$$

Wolfram Alpha is  
 Computer Algebra system that  
 can expand things like  
 $(x-i)(x-(-i))(x-(1+i))(x-(1-i))$   
 automatically.

On test, worst I'd ask you to  
 expand would be something like

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

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

$$(a-b)(a+b) = a^2 - b^2$$

$$(a-bi)(a+bi) = a^2 + b^2$$

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

$$9 + 1 = 10$$

Different  
 "styles"

$$= x^2 - 6x + 10$$

$$(x-3-i)(x-3+i) = x^2 - 3x + \underline{ix} - 3x + 9 - \underline{3i} - \underline{ix} + \underline{3i} - \underline{i^2}$$

$$= x^2 - 6x + 10$$