

#18

$$x = 3, \quad x = 2 \pm 3i$$

$$i^2 = -1$$

$$x - 3 = 0$$

$$(x - 2)^2 = (\pm 3i)^2$$

$$(x - 2)(x - 2) = (\pm 3)^2 (i)^2$$

$$x^2 - 2x - 2x + 4 = 9(-1)$$

$$x^2 - 4x + 4 = -9$$

$$x^2 - 4x + 13 = 0$$

$$(x - 3)(x^2 - 4x + 13)$$

$$= x^3 - 4x^2 + 13x - 3x^2 + 12x - 39$$

$$x^3 - 7x^2 + 25x - 39$$

# HW quiz 9-17

Seminar

Write a 3<sup>rd</sup> degree polynomial with zeros  $x=2$  and  $x=1+i$

## Finding a polynomial from a sketch

Ex.

Zero of the polynomial  
 $(-1, 0)$   
 $(2, 0)$   
The graph is tangent to the x-axis (double root)  
y-int

$$y = a(x-2)^2(x+1)$$
$$a(0-2)^2(0+1) = -2$$
$$a \cdot 4 \cdot 1 = -2$$
$$a = -\frac{1}{2}$$

$$y = -\frac{1}{2}(x-2)^2(x+1)$$

$$= -\frac{1}{2}(x^2 - 4x + 4)(x+1)$$

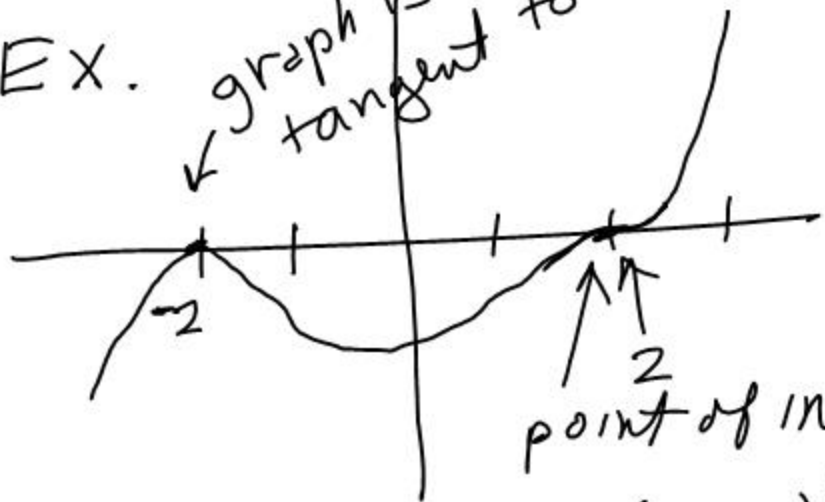
$$= -\frac{1}{2}(x^3 + x^2 - 4x^2 - 4x + 4x + 4)$$

$$= -\frac{1}{2}(x^3 - 3x^2 + 4)$$

$$\left. \begin{array}{l} (x-2)(x-2) \\ x^2 - 2x - 2x + 4 \\ x^2 - 4x + 4 \end{array} \right\}$$

$$y = -\frac{1}{2}x^3 + \frac{3}{2}x^2 - 2$$

EX. graph is tangent to the x-axis: factor  $(x+2)^2$



point of inflection (flex point)

$$(x-2)^3$$

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HW # 25, 28, 30

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