

Tuesday, October 4

Test on Thursday

Reassessment Next Week!

Do Now:

Homework on desk!

Write the equation of the polynomial with the given roots.

$$(x-4)(x+4) \\ x^2+16$$

$$x = -i, 3i, -3i, i$$

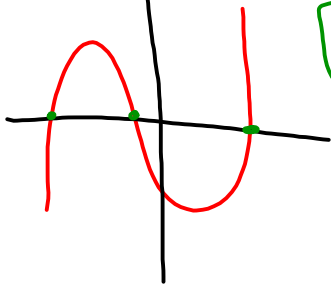
$$(x+i)(x-i)(x+3i)(x-3i) \\ (x^2+1)(x^2+9)$$

$$x^4 + 9x^2 + x^2 + 9$$

$$y = x^4 + 10x^2 + 9$$

Oct 4-7:42 AM

Questions from Homework?



$$x = -2, 0, 3$$

$$(x+2)(x-0)(x-3)$$

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

$$x(x^2 - x - 6)$$

$$x^3 - x^2 - 6x$$

$$x = 0, 0, -8$$

$$(x-0)(x-0)(x+8)$$

$$x \cdot x \cdot (x+8) \\ \hookrightarrow x^2(x+8)$$

$$x(x^2 + 8x)$$

$$y = x^3 + 8x^2$$

Oct 4-10:09 AM

Learning Target:

I can find all the roots of a polynomial!

(Notes on the back of last night's homework)

Oct 4-8:18 AM

Finding the Roots:

- 1) Rewrite to set =0  $\rightarrow 3x^4 + 12x^2 = 6x^3$   
 $3x^4 - 6x^3 + 12x^2 = 0$
- 2) Factor  $\rightarrow 3x^2(x^2 - 2x + 4) = 0$   
 $3x^2 = 0$   $x = 0$
- 3) Set each factor to 0  $\rightarrow x^2 - 2x + 4 = 0$
- 4) Use Quadratic formula if necessary  

$$x = \frac{-(-2) \pm \sqrt{4 - 4(1)(4)}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-12}}{2}$$

Oct 4-8:19 AM

How many roots can a polynomial have?

$$P(x) = 5x^{\textcircled{3}} - 2x + 6$$

As many as the highest degree

$$P(x) = x^6 + 2x^3 - 5$$

Oct 4-8:22 AM

Find all Zeros of:

$$x^4 = 16$$

$$x^4 - 16 = 0$$

$$(x^2 - 4)(x^2 + 4) = 0$$

$$(x - 2)(x + 2)(x^2 + 4) = 0$$

$$x - 2 = 0$$

$$\boxed{x = 2}$$

$$x + 2 = 0$$

$$\boxed{x = -2}$$

$$x^2 + 4 = 0$$

$$x^2 = -4$$

$$\sqrt{x^2} = \sqrt{-4}$$

$$x = \sqrt{-4}$$

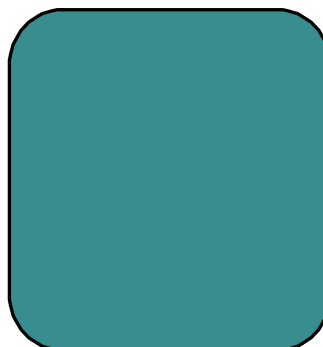
$$\boxed{x = \pm 2i}$$

Set equal to zero

Factor

Set factors equal to zero

Quadratic formula?



Oct 4-9:29 AM

Find all Zeros of:

$$x^2 + 7x - 13 = 0$$

$$\begin{aligned} a &= 1 \\ b &= 7 \\ c &= -13 \end{aligned}$$

$$x = \frac{-7 \pm \sqrt{49 - 4(1)(-13)}}{2(1)}$$

$$x = \frac{-7 \pm \sqrt{101}}{2}$$

$$\begin{array}{r} 49 \\ 52 \\ \hline 101 \end{array}$$

Set equal to zero

Factor

Set factors equal to zero

Quadratic formula?

Oct 4-9:29 AM

### Group Practice

- 1) Write your name on the top
- 2) We are going to solve step by step

Oct 4-9:30 AM

On the paper you have in front of you:

1) Set all the polynomials equal to zero

Oct 4-9:31 AM

On the paper you have in front of you:

2) Factor All Polynomials

①  $x^3 - 64$   
diff. of perf. cubes  
SOAP

$$(x-4)(x^2+4x+16)$$

② same as 3  $\begin{array}{r} 9 \mid -10 \\ \hline \end{array}$

$$(x^2-1)(x^2-9)$$

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

③  $x^4 - 5x^2 - 36 = 0$   
Quartics  $\begin{array}{r} -36 \mid -3 \\ \hline \end{array}$

$$\left. \begin{array}{l} (x^2-9)(x^2+4) \\ (x-3)(x+3)(x^2+4) \end{array} \right\}$$

④  $x^3 + 3x^2 - x - 3 = 0$   
group

$$x^2(x+3) - 1(x+3)$$

$$(x^2-1)(x+3)$$

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

Oct 4-9:31 AM

On the paper you have in front of you:

3) Set all factors equal to zero

$$(x-3)(x+3)(x^2+4)$$
$$\boxed{x=3} \quad \boxed{x=-3} \quad x^2=-4$$
$$x=\sqrt{-4}$$
$$\boxed{x=\pm 2i}$$

Oct 4-9:31 AM

On the paper you have in front of you:

4) Use the quadratic formula if necessary

Oct 4-9:31 AM

Homework: Review Sheet - Due Thursday.

Exit Slip:

Factor the following:  $8x^3 - 125$

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Oct 4-9:34 AM

Oct 4-9:33 AM