Algebra II Honors
Ch 2 HW Revised Syllabus
Test: "A" day Friday, October 21/"B" day Monday, October 24

5		2.6 Finding Rational Zeros – *finding all zeros* 2.8 Analyzing Polynomial Functions	• Finding Zeros of Polynomial Functions WKST • Start Analyzing Polynomial Functions WKST
6		2.8 Analyzing Polynomial Functions/ Sketching Polynomial functions	• Analyzing Polynomial Functions WKST • Sketching Polynomial Functions WKST
7		Quiz: 2.5-2.7 Ch 2 Review	• Ch 2 Review WKST
8		Ch 2 Test	• *SPIRAL ASSIGNMENT 1

5. $f(x) = 2x^4 + 6x^3 - 7x + 9$

$$\frac{\text{constant}}{\text{lead. coeff.}} : \frac{\pm 1, \pm 3, \pm 9}{\cancel{\pm 1}, \pm 2}$$

$$\pm 1, \pm 3, \pm 9, \pm \frac{1}{2}, \pm \frac{3}{2}, \pm \frac{9}{2}$$

2.6 Finding ALL Zeros

Before finding all zeros consider whether the polynomial factors

- if YES, then factor completely

- if NO, then Use Rational Zero Thm.

*If the polynomial is QUADRATIC,
then try factoring, CTS, sq. root, quad formula

ex: Determine the best method for finding the zeros of the given polynomial

a) $f(x) = 10x^3 - 17x^2 - 7x + 2$

does not factor

use Rat. Zero thm.

b) $f(x) = 16x^4 - 54x$

looks factorable

$2x(8x^3 - 27)$

ex: Find all zeros.

a) $f(x) = x^3 + 7x^2 + 15x + 9$

$$\frac{\text{Constant}}{\text{L.C.}} = \frac{\pm 1, \pm 3, \pm 9}{\pm 1}$$

1	1	7	15	9
		1	8	
	1	8	23	

-1	1	7	15	9
		-1	-6	-9
	1	6	9	0

$x^2 + 6x + 9 = 0$

$(x+3)^2 = 0$

$x = -3$

$\{-1, -3\}$

mult. of 2

Rational Zero Theorem

1) List the possible rational zeros

2) Try a number on the list until you find a zero.

ex: Find all zeros.

b) $f(x) = x^3 - 9x^2 + 21x - 4$

$$\begin{array}{r|rrrr} 4 & 1 & -9 & 21 & -4 \\ & & 4 & -20 & 4 \\ \hline & 1 & -5 & 1 & 0 \end{array}$$

$x^2 - 5x + 1 = 0$

$$x = \frac{5 \pm \sqrt{25 - 4(1)(1)}}{2(1)}$$

$$x = \frac{5 \pm \sqrt{21}}{2} = \frac{5}{2} \pm \frac{\sqrt{21}}{2}$$

$$\left\{4, \frac{5}{2} \pm \frac{\sqrt{21}}{2}\right\}$$

ex: Find all zeros.

c) $f(x) = \underbrace{x^3 - 3x^2}\underbrace{+4x - 12}$

$0 = x^2(x-3) + 4(x-3)$

$0 = (x^2+4)(x-3)$

$x^2+4=0$ $\quad$ $x-3=0$

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

ex: Find all zeros.

$\{-1, 5, -2 \pm i\}$

d) $f(x) = x^4 - 16x^2 - 40x - 25$

Rational zeros: $\pm 1, \pm 5, \pm 25$

$$\begin{array}{r|rrrrr} -1 & 1 & 0 & -16 & -40 & -25 \\ & & -1 & 1 & 15 & 25 \\ \hline & 1 & -1 & -15 & -25 & 0 \end{array}$$

$x^3 - x^2 - 15x - 25 = 0$

$$\begin{array}{r|rrrr} 5 & 1 & -1 & -15 & -25 \\ & & 5 & 20 & 25 \\ \hline & 1 & 4 & 5 & 0 \end{array}$$

$x^2 + 4x + 5 = 0$

$x^2 + 4x + 4 + 5 - 4 = 0$

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

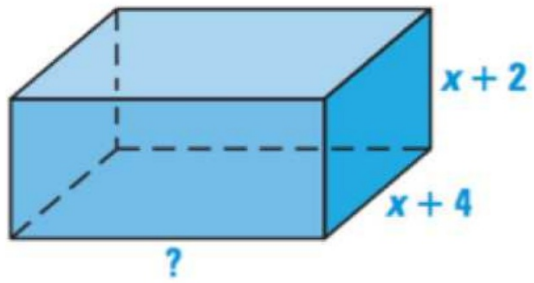
$x + 2 = \pm i$

$x = -2 \pm i$

Review

ex: Find the missing dimension.

$V = 2x^3 + 17x^2 + 46x + 40$



Review

ex: Simplify.

$$\frac{\left(3x^{-2}x^{10}y^{2}\right)^{-1}}{\left(2x^{3}y^{2}\right)^{3}}$$

Review

ex: If $f(3)=0$, which statement(s) about f(x) are true?

a) $x+3$ is a factor of f(x)

b) $x-3$ is a factor of f(x)

c) -3 is a root of f(x)

d) $\dfrac{f(x)}{x-3}$ has a remainder of zero.