

Warm up - Algebra II

1) Sketch: $y = -2x^3 + 12x^2 - 18x$

$-2x(x^2 - 6x + 9)$

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

F	Z	M	C/B
-2x	0	1	C
x-3	3	2	B



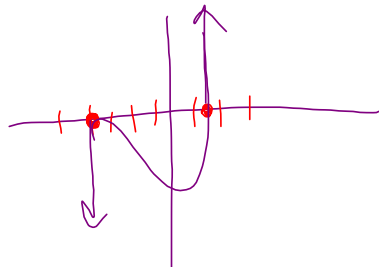
2) Find the value of $f(-1)$ using synthetic division for $-2x^4 - 5x^2 + x + 4$

-1	-2	0	-5	1	4	$f(-1) = -4$
	↓					
	2	-2	7	-8		
	-2	2	-7	8	-4	

3) Find the zeros and multiplicity of

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

F	Z	M	C/B
$2x-3$	$\frac{3}{2}$	3	C
$x+4$	-4	2	B



$$\textcircled{51} \quad 3x^3 + 10x^2 - x - 12 \div x - 4$$

$$\begin{array}{r} 4 \overline{) 3 \quad 10 \quad -1 \quad -12} \\ \underline{ \downarrow \quad 12 \quad 88 \quad 348} \\ 3 \quad 22 \quad 87 \quad 336 \end{array}$$

$$3x^2 + 22x + 87 \quad \frac{336}{x-4}$$

6.4 Solving Polynomials

Four term Cubic Functions

Higher Order Quadratics

Solve using a calculator

If you see 4 terms...Factor by grouping!

$$4) \quad x^3 + 3x^2 - 4x - 12 = 0$$

Step 1: Group 'em!

$$(x^3 + 3x^2)(-4x - 12)$$

Step 2: Factor each group

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

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

Step 3: Solve

$$x+3=0$$

↓

$$x = -3$$

$$x^2 - 4 = 0$$

↓

$$x = \pm 2$$

$$x^2 = 4$$

$$5) \quad 2x^3 - 8x^2 - 5x + 20 = 0$$

$$(x-4)(2x^2-5)$$

$$\downarrow$$

$$x = 4$$

$$\downarrow$$

$$2x^2 = 5$$

$$x^2 = \frac{5}{2}$$

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

If you see a quartic...hidden quadratic!

6) Solve: $x^4 - 6x^2 - 27 = 0$

Step 1: What factors of -27 add to -6?

$$F: -27 \quad A: -6$$

$$-9, 3$$

Step 3:

Step 2: What are the factors of x^4 ?

$$(x^2 - 9)(x^2 + 3)$$

Step 4: Solve.

$$x^2 - 9 = 0 \quad x^2 + 3 = 0$$

$$x^2 = 9 \quad x^2 = -3$$

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

$$x^4 - 6x^2 - 27$$

7) Solve: $x^4 - 4x^2 - 45 = 0$

$$(x^2 - 9)(x^2 + 5) = 0$$

$$x^2 = 9 \quad x^2 = -5$$

$$x = \pm 3 \quad x = \pm \sqrt{5}i$$

8) Solve: $x^4 - 49 = 0$

$$F: -49 \quad A: 0$$

$$(x^2 - 7)(x^2 + 7)$$

$$\downarrow \quad \downarrow$$

$$x = \pm \sqrt{7} \quad x = \pm \sqrt{7}i$$

If you are given a calculator...find zeros

9) Solve with a calculator.

$$x^3 - 19x = -2x^2 + 20$$

Step 1: Get into $y = \underline{x^3 + 2x^2 - 19x - 20}$

Step 2: Graph

Step 3: Find Zeros using 2nd, Trace, zeros

Homework

p. 330 #3-7 odd (no calculator),
27-33 odd,
44-49 all, 54, 59

Sum and Differences of Cubes Discovery Activity

Multiply:

- $(x + 2)(x^2 - 2x + 4)$
- $(x - 1)(x^2 + x + 1)$
- $(2x + 3)(4x^2 - 6x + 9)$