You can now finish hwk #22

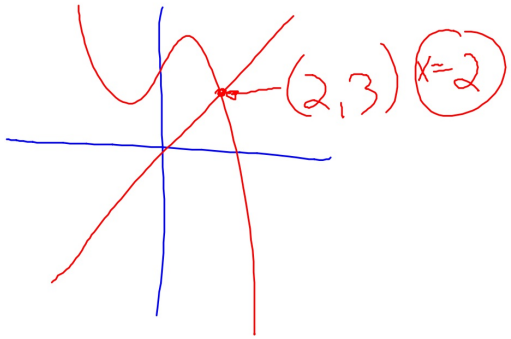
Sec 6-4: Solving Polynomial Equations:

1. Graphing
   a. Finding Zeros
      One side must equal zero
   b. Finding Intersections
      Graph the two sides of the equation separately.

2. Factoring

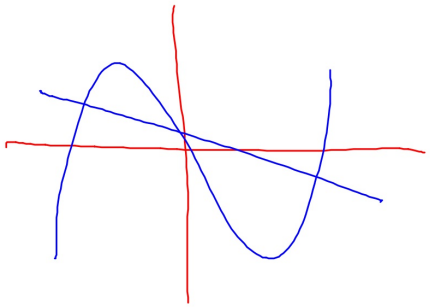
Solve this polynomial equation by graphing.

$-2x^3 + 4x^2 - x + 5 = 2x - 1$



Solve this polynomial equation by graphing.

$x^3 + 2x^2 - 11x - 12 = -0.5x + 1$



X = -3.85
-1.13
2.98

Factor each completely.

1. $3x^3 - 3x^2 - 126x$

2. $8x^2 - 2x - 15$

3. $8x^2 - 98$

1. $3x^3 - 3x^2 - 126x$

$3x(x^2 - x - 42)$

	x	6
x	x^2	$6x$
-7	$-7x$	-42

-42, -7, 6, -1

$3x(x-7)(x+6)$

2. $8x^2 - 2x - 15$

-120, -12, 10, -2, $2x$, -3

$(2x-3)(4x+5)$

$4x$	$8x^2$	$-12x$
5	$10x$	-15

3. $8x^2 - 98$

$2(4x^2 - 49)$

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

Expand. $(x^2 - 5)(x^2 + 3)$ = $x^4 - 5x^2 + 3x^2 - 15$

$x^4 - 2x^2 - 15$

Factor. $x^4 + 3x^2 - 28$

Factoring using a Quadratic Pattern

$-4 \times +7 = -28$, $-4 + 7 = +3$

$(x^2 - 4)(x^2 + 7)$

$(x \pm 2)(x^2 + 7)$

Find all solutions by factoring.

Yes, you must make one side equal to zero in order to solve by factoring!

1. $8x^3 + 44x^2 - 24x = 0$

$4x(2x^2 + 11x - 6)$

$-12 \times -1 = +12$, $-12 + (-1) = 11$

$4x(2x - 1)(x + 6)$

$x = 0, \frac{1}{2}, -6$

2. $x^4 - 14x^2 - 32 = 0$

$-32 \times 2 = -16$, $-32 + 2 = -14$

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

$\pm 4, \pm i\sqrt{2}$

# of solutions to polynomial equations.

When you include both real and imaginary solutions a polynomial of degree n will have exactly n solutions.

Find all solutions by factoring.

3. $7x^3 - 35x = 0$

$7x = 0$

$7x(x^2 - 5) = 0 \rightarrow x^2 - 5 = 0$

$x = 0, \pm\sqrt{5}$

4. $5x^5 - 80x = 0$

$5x(x^4 - 16)$

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

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

$x = 0, \pm 2, \pm 2i$