Integrated Math 3
Unit 6: Polynomials
6.6

Name: _____

Date: _____ Period: _____

Objective: to solve simultaneous functions using the graphing calculator.

Warm-up:

1. Factor $x^2 - 6x + 5$

$(x-1)(x-5)$

	x	-5
x	x^2	$-5x$
-1	$-x$	5

2. Factor $x^3 - 2x^2 - 3x + 6$

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

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

3. Solve $(x^2 - 1)(x^2 - 2x + 1) = 0$

$(x-1)(x+1)(x-1)(x-1) = 0$

$x=1 \quad x=-1 \quad x=1 \quad x=1$

$(-1,0), (1,0)$

4. What does a solution to an equation tell you?

It tells you where the x-intercepts are located!

Steps to solving using a graphing calculator:

1. Type the left side of the equation into the graphing calculator ($\mathbf{Y_1}$)
2. Type the right side of the equation into the graphing calculator ($\mathbf{Y_2}$)

   Note: Be sure to put parenthesis around both the numerator & denominator for fractions.
3. Graph the equations
4. **2nd → Calc → Intersect....** Then follow the prompts to give the calculator a restricted domain.

Example 1: Solve each of the following using your graphing calculator (round to the nearest thousandth).

a. $\sqrt{x+5} = 5 - \sqrt{x}$

$Y_1 = \sqrt{(x+5)}$

$Y_2 = 5 - \sqrt{(x)}$

$x = 4$

b. $\frac{3x+5}{x-2} = \frac{x-6}{5x+1}$

$Y_1 = (3x+5)/(x-2)$

$Y_2 = (x-6)/(5x+1)$

$x = -2.75, 0.18$

c. $\frac{1}{2}x^2 - 5 = -x + 3$

$Y_1 = (1/2)X^2 - 5$

$Y_2 = -X + 3$

$x = -5.12, 3.12$

d. $\log(x+7) = |2x+5| - 3$

$Y_1 = \log(x+7)$

$Y_2 = |2x+5| - 3$

$x = -4.22, -0.60$

e. $\sqrt{3x+2}^2 = \sqrt{6x+4}^2$ *no calculator needed!

$3x+2 = 6x+4$
$-3x \quad -3x$
$2 = 3x+4$
$-4 \quad -4$
$-2 = 3x$
$\frac{-2}{3} = \frac{3x}{3}$

$x = -2/3$

f. $3^{x+5} = 3\ln(x+6) + 2$

$Y_1 = 3\wedge(X+5)$
$Y_2 = 3\ln(X+6)+2$

$X = -5.36, -3.61$

g. $-\frac{1}{4}|3x-5| = 2\log(3-x)$

$Y_1 = -(1/4)|3X-5|$
$Y_2 = 2\log(3-X)$

$X = 2.52$

h. $\sqrt{3x-2} = 4 - \sqrt{2x-3}$

$Y_1 = \sqrt{(3X-2)}$
$Y_2 = 4 - \sqrt{(2X-3)}$

$X = 2.68$

Reflect: What are the key steps to remember from today?

Practice: Solve each of the following using your graphing calculator (round to the nearest thousandth).

a. $x^3 = x^2 - 1$

$Y_1 = X\wedge 3$
$Y_2 = X\wedge 2 - 1$

$X = -.755$

b. $\sqrt{3x-2} = 4 - \sqrt{2x-3}$

$Y_1 = \sqrt{(3X-2)}$
$Y_2 = 4 - \sqrt{(2X-3)}$

$X = 2.685$

c. $3^{x+5} = 3\ln(x+6) + 2$

$Y_1 = 3\wedge(X+5)$
$Y_2 = 3\ln(X+6)+2$

$X = -5.357, -3.608$

d. $-\frac{1}{4}|3x-5| = 2\log(3-x)$

$Y_1 = (-1/4)|3X-5|$
$Y_2 = 2\log(3-X)$

$X = 2.522$

e. $\frac{1}{2}x^2 - 5 = -x - 1$

$Y_1 = (1/2)X\wedge 2 - 5$
$Y_2 = -X - 1$

$X = -4, 2$

f. $\sqrt{3x+2}^2 = \sqrt{6x+4}^2$

$3x+2 = 6x+4$
$-3x \quad -3x$
$2 = 3x+4$
$-4 \quad -4$
$\frac{-2}{3} = \frac{3x}{3}$

$X = -\frac{2}{3}$