Algebra 2   Name: _____

T8 REVIEW: Systems of Equations; Quadratic   Date: _____

Word Problems

Calculator required for (1-3).

1. A motorcyclist jumps off a ramp that it is modeled by the function $y = -\frac{1}{640}(x - 80)^2 + 30$ where y is the height in feet and x is the horizontal distance in feet traveled. (how do you set your window so you can see the parabola?)

What was the highest the motorcyclist got as he sailed through the air?

How far did the motorcycle travel before it landed on the ground?

2. Niagara Falls is made up of three waterfalls. A log falls from the top of the Canadian Horseshoe Falls from a height of 188 ft.

Using this model, $h(t) = -16t^2 + v_o t + h_o$, ($v_0$ is velocity, and h_o is the original height) write an equation that models the log drop. (Is there velocity if something is dropped versus something that is thrown??) (is your window set correctly?)

How long does it take for the log to reach the river below?

3. A company sells three types of gift baskets. The basic basket has two movie passes and one package of microwave popcorn, and costs $15.50. The medium basket has two movie passes, two packages of microwave popcorn, one DVD, and costs $37. The super basket has four movie passes, three packages of microwave popcorn, two DVDs, and costs $72.50. Fill in the table below. Use your calculator answer the questions that follow.

REMINDER: everything you need to use is in the matrix menu (2nd matrix)

Basket	Movie Passes (x)	Microwave Popcorn (y)	DVD (z)	Total	Hint: Use rref to find the answer when using a matrix
Basic					
Medium					
Super					

Movie passes cost $ _____ per pass.

Microwave popcorn cost $ _____ per package.

DVDs cost $ _____ each

This page starts the <u>no calculator</u> set of problems.

4. Solve the system by SUBSTITUTION.
- Step 1: solve for a variable (choose a variable that has 1 as its coefficient)
- Step 2: substitute into the other two equations
- Step 3: from the two equations in step 2, choose one and solve for a variable again (choose wisely, remember you will have to divide by the coefficient of the variable you choose)
- Step 4: substitute what you solved for in step 3 into the OTHER equation you didn't use in step 2
- Step 5: retrace your work to find the values of all of the remaining variables.

$x - 2y + 3z = 9$
$-x + 3y = -4$
$2x - 5y + 5z = 17$

5. Solve the system by ELIMINATION. (adding opposite terms "eliminates" a variable)
- Step 1: Choose a variable to eliminate using two of the three equations. You may have to multiply a number to an equation to create opposite terms.
- Step 2: Choose two different equations (from the original equations) and eliminate the SAME variable that you chose in step 1.
- Step 3: Using the final equation from step 1 and the final equation from step 2, choose a variable to eliminate. You may have to multiply a number to an equation to create opposite terms.
- Step 4: retrace your work to find the value of the remaining variables.

$x - y + 2z = -8$
$x + y + z = 6$
$3x + 3y + 4z = 28$

6. Graph the system of non-linear functions. Find the point of intersection(s) and write as an ordered pair (x, y). There can be one answer, two answers, or no answers.

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

$y = 2x - 3$
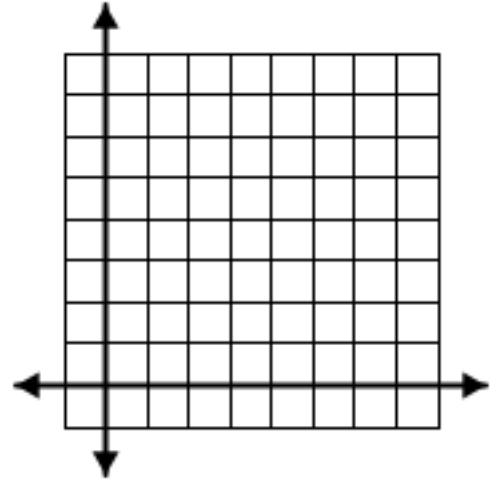
7. Graph the system of Linear Inequalities.

(Remember $y = mx + b$)

(The answer is the shaded region common to all three lines so don't forget to shade.)

(also remember the difference between drawing a dashed line and a solid line??)

$y \geq x + 3$

$y > -2x + 1$

$x + 2y < 8$