3x3 System Application Problems   Name: _____

1) Find the equation of a parabola in standard form, $y = ax^2 + bx + c$, that passes through the following three points: (-1, 9), (1, -1), and (2, 3).   Solution: $y = 3x^2 - 5x + 1$

2) A news clipping from a recent issue of the Temple Daily Telegram reads: Solution: 1st: 7, 2nd: 10, 3rd: 3

Belton, TX – Belton High School prevailed in Saturday's track meet with the help of 20 individual-event placers earning a combined total of 68 points. A first-place finish earns 5 points, a second-place finish earns 3 points, and a third-place finish earns 1 point. BHS had a strong second-place showing, with as many second-place finishers as first- and third-place finishers combined.

How many BHS athletes finished in each place?

3) An advertisement from the back page of the Belton Journal: Solution: sofa $800, loveseat $500, chair $300

$1300
Sofa and love seat

$1400
Sofa and two chairs

$1600
Sofa, love seat, one chair

Dan's Furniture Store

How much does each piece of furniture cost individually?

4) You have $25 to spend while picking 21 pounds of apples at Apple Valley Orchard in Llano, TX. Empire apples cost $1.40 per pound, Red Delicious apples cost $1.10 per pound, and Golden Delicious apples cost $1.30 per pound. You want to buy twice as many Red Delicious apples as the other two combined. How many pounds of each apple should you buy?   Solution: Empire 5 lbs, Red 14 lbs, Golden 2 lbs

5) Tasty Bakery sells three kinds of muffins: chocolate chip muffins at 40 cents each, oatmeal muffins at 45 cents each, and cranberry muffins at 50 cents each. Charles buys some of each kind and chooses three times as many cranberry muffins as chocolate chip muffins. If he spends $7.95 on 17 muffins, how many of each type of muffin did he buy?   Solution: choc. chip 3, oatmeal 5, cranberry 9

6) Explain how you know when a system has infinitely many solutions or when it has no solutions.

7) Explain why the following system of equations cannot be solved.

$7x + y + 6z = 1$

$-x - 4y + 8z = 9$