Name: _____

Applications of Linear Systems

Exercise 1: The Math Club is selling T-shirts for a profit of $4 each and caps for a profit of $5 each. The club wants to sell 50 items and make a profit of $230. How many of each item should the club try to sell?

Exercise 2: Randall wants to buy 10 bouquets. The standard bouquet costs $7, and the deluxe one costs $12. He can afford to spend $100.
   a) Write a system of equations for the number of standard bouquets x and the number of deluxe bouquets y that he can buy.
   b) Find the number of each type of bouquet he can buy.

Exercise 3: Two submarines began dives in the same vertical position to meet at a designated point. If one submarine was on a course approximated by the equation $x + 4y = -14$ and the other was on a course approximated by the equation $x + 3y = -8$, at what location would they meet? Write the coordinates of the point.

Exercise 4: A hot air balloon is 10 meters above the ground and rising at a rate of 15 meters per minute. Another balloon is 150 meters above the ground and descending at a rate of 20 meters per minute.
   a) Write a system of equations to represent the balloons.
   b) What is the solution of the system of equations?
   c) Explain what the solution means.

Exercise 5: A group of 3 adults and 10 students paid $102 for a cavern tour. Another group of 3 adults and 7 students paid $84 for the tour. Find the admission price for an adult and for a student. Let a = the price for an adult and s = the price for a student.

Exercise 6: The sum of the digits of a two-digit number is 8. If the tens digit is 4 more than the units digit, what is the number?

Exercise 7: The difference between two numbers is 15. The greater number is two less than twice the lesser number.
- a. Write a system of equations to represent this situation.
- b. Find the numbers.

Exercise 8: The sum of a number and twice a second number is 29. The second number is ten less than three times the first number.
- a. Write a system of equations to represent this situation.
- b. Find both numbers.

Exercise 9: The solution of a system of equations is (- 2, 5), and the first equation is $3x + 4y = 14$.
- a. Write a second equation for this system.
- b. Is this the only equation that could be in the system? Explain.