Name _____

Homework 11
Section 2.1

1. (3) The chirp rate of the snowy tree cricket is dependent on the ambient temperature and can be modeled surprisingly well by a linear function. Suppose that a snowy tree cricket chirps 40 times per minute when the temperature is 50°F and 180 times per minute when the temperature is 85°F. Determine the linear function which models the chirp rate, C (in chirps per minute), as a function of the temperature, T (in $^\circ F$).

2. (3) The water pressure (in pounds per square inch) on an underwater diver is a linear function of the diver's depth (in feet). During a particular dive, the following data are collected:

Depth, d	20	30	45
Pressure, P	23.4	27.7	34.15

   Determine the function $P = f(d)$ which gives pressure in terms of depth.

3. (4) Amanda leaves on a trip and travels at a constant 60 miles per hour. An hour-and-a-half later, Vanessa leaves from the same point in the same direction and travels at a constant 75 miles per hour. How long after Vanessa leaves will she catch Amanda?

4. (5) A chemist needs 40 ounces of an 18% chlorine solution for a certain experiment. She currently has only a $9\frac{1}{2}$% chlorine solution and a 22% chlorine solution. How much of each must she mix in order to create her needed solution?

5. (5) An evil scientist needs a 6% salt solution in order to conduct his next experiment. Unfortunately, his incompetent assistant added too much water and created 96 ounces of a 4% solution instead. After regaining his composure, the scientist realizes that he can let some of the water evaporate from the mixture, thus increasing the salinity. If the water in the mixture evaporates at a rate of 2 ounces per hour, how long must the scientist wait in order to perform his experiment?