

Homework #10

Instructions: Do the following problems on a **separate** sheet of paper.

1. There were 10,937 violent crimes committed in San Francisco in 1994 and 7409 violent crimes committed in 1998. It may or may not be a coincidence that these years are the exact years that Barry Bonds won Gold Gloves and Silver Sluggers while playing for the San Francisco Giants.

- Develop a linear equation describing the number of violent crimes in San Francisco as a function of the year.
- According to your equation, how many violent crimes were committed in San Francisco in 1995?
- If Barry Bonds hadn't injured his elbow in 1999, use your linear equation to determine the year in which there would have been only 5000 violent crimes.

2. The following (made-up) table describes the correlation between the average size of computers in cubic feet and the global land surface temperature in degrees Fahrenheit.

computer size	4	2	1	.5
global temp	40.6	42.6	43.6	44.1

- Find a linear equation that describes the global land surface temperature as a function of the average size of computers.
- According to your function, how large are computers when the global land surface temperature is 42.9?
- According to your function, how warm will the earth be when computers are one-tenth of a cubic foot?

3. The population of Petunia's ant colony increases by 19 every 4 weeks. Suppose the population today is 449.

- Find a linear equation that describes the population of Petunia's ant colony as a function of time in weeks.
- Use your equation to predict how many ants Petunia will have in 11 weeks from now.
- Use your equation to find how long ago Petunia had only 100 ants.

4. A model spaceship has a volume of 42 cm^3 , a surface area of 62 cm^2 and a length of 50 cm. If the real spaceship is 15000 cm long, find the volume and the surface area of the real spaceship.

5. A cylindrical tank has a height of 42 feet, a width of 50 feet, a surface area of 6,597.3 square feet, and a volume of 82,466.8 cubic feet. If we want to make a scale model of the tank that is 3 feet tall, find the width, the surface area, and the volume of the desired scale model.