Practice Problems (Linear Models)

1. Sam works as a waiter in a restaurant. He earns \$1,400 per month as a base salary, plus tips averaging 15% of the meals he serves. Write a linear model for the situation, and use it to find the amount earned if Sam serves meals worth a total of \$6,000.

2. There is a population of 200 tigers in a national park. They are being illegally poached at the rate of 8 per year. Assume the population is otherwise unchanging, and write a linear model and graph it. What does the *x*-intercept signify?

- 3. Sam is on a diet. He currently weighs 270 pounds. He loses 4 pounds per month.
 - *a*.) Write a linear model that represents Mr. Thompson's weight after *x* months.
 - b.) After how many months will Mr. Thompson reach his goal weight of 200 pounds?

4. Sam has \$28,000 in his bank account. Every month he spends \$1,200. He does not add money to the account.

a.) Write a linear model that shows how much money will be in the account after *x* months.

b.) How much money will he have in his account after 8 months?

- 5. Suppose a 5-minute overseas call costs \$4.91 and a 10-minute call costs \$10.86.
 - *a*.) Write a linear model of this situation.
 - *b*.) How long can you talk on the phone if you have \$15 to spend?

- 6. Biologists have found that the number of chirps some crickets make per minute is related to temperature. The relationship if very close to being linear. When crickets chirp 124 times per minute, it is about 68 degrees Fahrenheit. When they chirp 172 times per minute, it is about 80 degrees Fahrenheit.
 - *a*.) Write a linear model of this situation.
 - *b.*) How warm is it when the crickets are chirping 150 times per minute?