Name: _____

2.2.D1 – MODELING WITH LINEAR FUNCTIONS

Past due on: _____ Period: _____

Write a linear function equation, in standard form, that models each situation.

1. Suppose you are preparing a snack mix. You want the total protein from peanuts and granola to equal 28 grams. Peanuts, p, have 7 grams of protein per ounce, and granola, g, has 3 grams of protein per ounce.

2. You notice a new food truck that drives past your house during the week. The food truck sells hotdogs, h, for \$1.50 and hamburgers, b, for \$3.00. The total amount of money you have is \$24.00.

3. Suppose your school is having a talent show to raise money for new music supplies. You estimate that 200 students, s, and 150 adults, a, will attend. You estimate your expenses to be \$200. Write an equation to find what ticket prices you should set to raise \$1000.

Find a linear function, in slope-intercept form, that models each situation.

4. A company's revenue has been increasing by \$20 thousand each year. In 2011, the revenue was \$730 thousand. Write a formula that represents the company's revenue, R, is a linear function of the years after 2000, t.

5. A hot-air balloon is descending at a rate of 2.5 meters per second. After 90 seconds, its altitude is 440 meters. Write a formula that gives the altitude of the hot-air balloon, A, is a function of the time it has been descending, t.

6. From 1994 – 2004, the annual sales of a small company increased by \$10 thousand per year. In 1997 the annual sales were \$97 thousand. Write a formula that represents the annual sales, S, are a function of the number of years since 1994, t.

7. A new Toyota Rav4 costs \$21,500. The car's value depreciates linearly to \$11,900 in three years time. Write a formula that expresses the value, V, in terms of its age, t, in years.

8. In 1950, the number of people age 65 and older who lived in the United States was 12 million. By 2005, that number had grown to 37 million people. Write a formula that models the number of people who are age 65 and older, P, as a linear function of the number of years since 1950, t.

9. A car company has found a linear relationship between the amount of money it spends on advertising and the number of cars it sells. Suppose when it spent \$50,000 on advertising it sold 500 cars. Moreover, assume for each additional \$5000 spent, it will sell 20 more cars. Find a formula for C, the number of cars sold, as a linear function of the amount spent on advertising, a.

10. At a price of \$2.30 per gallon, the average weekly demand by consumers for gasoline is 42 gallons. If the price rises to \$2.35 per gallon, the weekly demand drops to 39 gallons. Find a formula for Q, the weekly quantity of gasoline demanded, as a function of p, the price per gallon.

11. You own a kayak company and open only during the summer months. You discover that if you sell a certain type of kayak for \$400, you sales per day average \$5200. If you raise the price of the kayak to \$450, the sales fall to approximately \$3600 per day. The daily sales, S, are a function of the price per kayak, p.

12. In a college meal plan you pay a membership fee; then all of your meals are a fixed price per meal. If 90 meals cost \$1005 and 50 additional meals cost \$1205, write a linear function that describes the cost of a meal plan, C, in terms of the number of meals, m.