Day 7

Word Problems

1. Joanna and Diana are starting a business tutoring students in math. In one month, they rent an office that costs them $500 and charge the students $30 per hour.
    a. Write an equation relating number of hours and total earnings. Define your variables.
    b. How many hours do they have to tutor to break even (make $0 in total earnings)

2. Jing is tracking the progress of her plant's growth. When she purchases the plant, it is 6.5cm high, and it grows 1.25cm per day.
    a. Write an equation that models the plant's growth. Define your variables.
    b. How tall is it after 2 weeks?

3. A salesperson at a car dealership receives a base salary of $25 000 and a commission of 3% of the car sales she makes for the dealership.
    a. Write a linear model that shows the salesperson's total income. Define your variables.
    b. If she makes a total income of $49 762, what were her sales for the year?

4. A plane is taking off at a rate of 2500 feet per minute.
    a. Write a linear equation relating the plane's height to time. Define your variables.
    b. How long does it take the plane to reach a height of 30 000 feet?

5. An 800ml bucket has a hole and is leaking water at a constant rate of 7ml/s.
    a. Write an equation relating time, and the amount of water left in the bucket. Define your variables.
    b. How long will it take until the bucket is empty?

6. A company is tracking its sales over the years. The company began tracking its sales in 2005. By 2007, its sales were $17 735. In 2012, its sales were $15 035.
    a. Assuming a constant rate of decline, create an equation relating sales to years. Define your variables.
    b. What were the sales in 2010?
    c. When will the company go broke ($0 in sales)?

7. Alexa is performing an experiment where she the measures the temperature of a cup of water while it heats up. After 5 minutes, the temperature is 55°C. After 12 minutes, the temperature is 83°C.
    a. Create an equation relating time to temperature. Define your variables.
    b. What was the temperature of the water when the experiment began?

8. Anjelika is renting a limo for an event. For 7h of service, the limo company charges $315. For 24h of service, the limo company charges $1080.
    a. Write an equation relating time to cost. Define your variables.
    b. How much will it cost to rent the limo for 3h?

Solutions to "Other Word Problems"

1a) Let x be number of hours. Let y be total profit. y = 50x − 500
b) x = 10 hours

2a) Let x be number of days. Let y be height. y = 1.25x + 6.5
b) y = 24cm

3a) Let x be car sales. Let y be her income. y = 0.03x + 25 000
b) x = $825 400

4a) Let x be number of minutes. Let y be height. y = 2500x
b) x = 12 minutes

5a) Let x be number of seconds. Let y be volume. y = −7x + 800
b) x = 114.29 seconds

6a. Let x be time (years). Let y be sales ($). y = −520x + 18 675
b. y = $16 075
c. In the year 2040 (when x = 35)

7a. Let x be time (minutes). Let y be temperature (°C). y = 4x + 35
b. y = 35°C

8a. Let x be time (hours). Let y be cost ($). y = 45x
b. y = $135