Word problems in Slope-intercept form

When a word problem involves a constant rate or speed and a beginning amount, it can be written in slope-intercept form: $y = mx + b$. To do this, recognize which number will represent *m*, the rate, and which number will represent *b*, the y-intercept.

1. You are visiting Baltimore, MD and a taxi company charges a flat fee of $3.00 for using the taxi and $0.75 per mile.

   A. Write an equation that you could use to find the cost of the taxi ride in Baltimore, MD. Let x represent the number of miles and y represent the total cost.
   B. How much would a taxi ride for 8 miles cost?
   C. If a taxi ride cost $15, how many miles did the taxi travel?

2. A plumber charges $50 to make a house call. He also charges $25.00 per hour for labor.

   A. Write an equation that you could use to the amount a plumber charges for a house call based on the number of hours of labor.
   B. How much would it cost for a house call that requires 2.5 hours of labor?
   C. If the bill from the plumber is $162.50, how many hours did the plumber work at your house?

3. An airplane 30,000 feet above the ground begins descending at the rate of 2000 feet per minute. Assume the plane continues at the same rate of descent. The plane's height and minutes above the ground are related to each other.

A. Write an equation to model the situation.
B. Find the altitude of the plane after 5 minutes.

Word Problems using Point-slope form

When a word problem involves a constant rate or speed and gives a relationship at some point in time between each variable, an equation can be written in point-slope form to model the relationship.

4. While on vacation in Washington DC, the cab ride for the Dulles airport to the hotel is 15 miles. The total cost of the cab ride was $25.50. The cabbie charges $1.50 per mile for the entire trip.

A. Write an equation to that can be used to determine how much a cab ride would cost anywhere in Washington DC.
B. What is the flat rate of the cab ride?
C. How much does it cost to travel 7 miles in a cab?

5. Marty is spending money at the average rate of $3 per day. After 14 days he has $68 left. The amount left depends on the number of days that have passed.

A. Write an equation for the situation.
B. Find the amount of money he began with.
C. How much money does Marty have after 9 days?

More Word Problems using Point-slope form

Sometimes instead of giving a rate, a word problem gives two relationships at different points in time between variables. This kind of problem is giving you two points. You must find the slope and then use one of the points to write an equation.

7. The math department sponsors a Math Family Fun Night each year. In the first year, there were 35 participants. In the third year, there were 57 participants.

A. Write an equation to predict how many participants at any given year.
B. How many participants are predicted for the 5^{th} year?

8. Suppose a 5-minute overseas call costs $5.91 and a 10-minute call costs $10.86. The cost of the call and the length of the call are related. The cost of each minute is constant.

A. What is the cost, *c*, of a call of *m* minutes duration?
B. How long can you talk on the phone if you have $12 to spend?

9. Biologists have found that the number of chirps some crickets make per minute is related to temperature. The relationship is very close to being linear. When crickets chirp 124 times a minute, it is about 68°F. When they chirp 172 times a minute, it is about 80°F.

A. Find an equation for the line that models this situation.
B. How warm is it when the crickets are chirping 150 times a minute?

Practice.

1. Lynn is tracking the progress of her plant's growth. Today the plant is 5 cm high. The plant grows 1.5 cm per day.

A. Find an equation that represents the plants height after any given number of days.
B. How tall is the plant after 9 days?

2. A plane loses altitude at the rate of 5 meters per second. It begins with an altitude of 8500 meters. The plane's altitude is a function of the number of seconds that pass.

A. Write an equation modeling this situation.
B. Use your equation to find out how much time will pass before the plane will land (hint: what is the altitude when the plane lands?)

3. An internet service provider charges $18 per month plus an initial set –up fee. One customer paid a total of $81 after 2 months of service.

A. Write an equation modeling this situation.
B. What is the initial set-up fee?
C. How much does it cost after 5 months of service?

4. Your gym membership costs $33 per month after an initial membership fee. You paid a total of $228 after 6 months.

A. Write an equation that gives you the total cost related to the months of your gym membership.
B. Find the total cost after 9 months.

5. All tickets for a concert are the same price. The ticket agency adds a fixed fee to every order. A person who orders 5 tickets pays $93. A person who orders 3 tickets pays $57.

A. Write an equation relating the total cost to the number of tickets purchased.
B. How much do 4 tickets cost?