Writing Linear Equations from Words

Linear functions can be written in the form of y = mx + b;

Where m = slope (highlight yellow)

Underline key words to let you know if the slope is positive or negative

B = y-intercept or initial value (highlight green)

Use **bold face** to indicate if the y-intercept is **positive or negative**

Example: Suppose that the **water level** of a river is 34 feet and that it is receding (negative) at a rate of 0.5 foot per day. Write an equation for the water level, *L,* after *d* days. L = -0.5d + 34

In how many days will the water level be 26 feet? 26 represents the level L so

 26 = -0.5d + 34

 26 - 34 = -0.5d + 34 - 34

 -8 = -0.5d (divide each side by -0.5)

 D = 16

 After 16 days the water level will be 26 ft.

1. For babysitting, Nicole charges a flat fee of $3, plus $5 per hour. Write an equation for the cost, *C,* after *h* hours of babysitting.

How much money will she make if she baby-sits 5 hours?

2. A plumber charges $25 for a service call plus $50 per hour of service. Write an equation in slope-intercept form for the cost, *C,* after *h* hours of service.

What will be the total cost for 8 hours of work?

3. Rufus collected 100 pounds of aluminum cans to recycle. He plans to collect an additional 25 pounds each week. Write an equation for the total pounds, *P,* of aluminum cans after *w* weeks.

How long will it take Rufus to collect 400 pounds of cans?

 4. A canoe rental service charges a $20 transportation fee and $30 dollars an hour to rent a canoe. Write an equation representing the cost, *y,* of renting a canoe for *x* hours.

What is the cost of renting the canoe for 6 hours?

5. An attorney charges a fixed fee on $250 for an initial meeting and $150 per hour for all hours worked after that. Write an equation in slope-intercept form.

Find the charge for 26 hours of work.

6. A water tank already contains 55 gallons of water when Baxter begins to fill it. Water flows into the tank at a rate of 8 gallons per minute. Write a linear equation to model this situation.

Find the volume of water in the tank 25 minutes after Baxter begins filling the tank.

7. A video rental store charges a $20 membership fee and $2.50 for each video rented. Write a linear equation to model this situation.

If 15 videos are rented, what is the revenue?

If a new member paid the store $67.50 in the last 3 months, how many videos were rented?

8. Tim buys a new computer for his office for $1200. For tax purposes, he declares a linear depreciation (loss of value) of $200 per year. Let *y* be the declared value of the computer after *x* years. Write an equation to represent the value of the computer (y) after any given number of years (x)

 Find the value of the computer after 4.5 years.