Y = mx + b Word Problems

1. Suppose that the water level of a river is 34 feet and that it is receding at a rate of 0.5 foot per day. Write an equation for the water level, L, after d days. In how many days will the water level be 26 feet?

2. Seth's father is thinking of buying his son a six-month movie pass for $40. With the pass, matinees cost $1.00. If matinees are normally $3.50 each, how many times must Seth attend in order for it to benefit his father to buy the pass?

3. 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. What do you think the slope and the y-intercept represent? How much money will she make if she baby-sits 5 hours?

4. 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? 10 hours of work?

5. Rufus collected 100 pounds of aluminum cans to recycle. He plans to collect an additional 25 pounds each week. Write and graph the equation for the total pounds, P, of aluminum cans after w weeks. What does the slope and y-intercept represent? How long will it take Rufus to collect 400 pounds of cans?

6. A canoe rental service charges a $20 transportation fee and $30 dollars an hour to rent a canoe. Write and graph an equation representing the cost, y, of renting a canoe for x hours. What is the cost of renting the canoe for 6 hours?

7. A caterer charges $120 to cater a party for 15 people and $200 for 25 people. Assume that the cost, y, is a linear function of the number of x people. Write an equation in slope-intercept form for this function. What does the slope represent? How much would a party for 40 people cost?

8. Attorney A 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. Attorney B charges $150 for the initial meeting and $175 per hour. Find the charge for 26 hours of work for each attorney. Which is the better deal? At how many hours does this attorney become a better deal?

9. 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.

10. A video rental store charges a $20 membership fee and $2.50 for each video rented. Write and graph a linear equation ($y=mx+b$) 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?

11. Casey has a small business making dessert baskets. She estimates that her fixed weekly costs for rent and electricity are $200. The ingredients for one dessert basket cost $2.50. If Casey made 40 baskets this past week, what were her total weekly costs?   Her total costs for the week before were $562.50. How many dessert baskets did she make the week before?

12. Graph $y = x$, $y = 2x$, and $y = 3x$ on the same coordinate plane. How are the graphs alike? How are they different? Compare the slopes.

13. 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. What is the slope of the line that models this depreciation?
Find the y-intercept of the line. Write a linear equation in slope-intercept form to model the value of the computer over time.
Find the vale of the computer after 4.5 years.

14. The slope of a roof is called the pitch and is defined as follows:
        pitch = <u>rise of roof</u>
                    ½ span of roof
Find the pitch of a roof if the rise is 12 feet and the span is 30 feet.
Find the pitch of a roof if the rise is 4 feet and the span is 24 feet.

15. A bus company took a tour bus on the ferry when there were 30 people aboard. The ferry charged the bus company $180. The following week, the bus had 50 people on board and the ferry charged them $220. How much is the "base rate" for the empty bus? How much does each person cost? Show this using y = mx + b form.

16. I rent a gym for $150.00 for 30 students. Another time I rent the gym for @270.00 for 70 students. I need to find a fixed rate.

17. Jim has to choose between two gym membership plans.
      Plan A: $50 monthly membership fee and $10 per visit.
      Plan B: costs $25 monthly one time membership fee and $15 per visit

18. A Pizza restaurant offers the following deals"

   Deal #1: $8.99 for on large pizza and $5 for each additional large pizza on the same order

   Deal#2: $6.00 per large pizza

   At what number of pizzas does Deal #1 become a better deal?
   What is the cost of 10 pizzas for each deal?
   What is the cost per pizza in Deal #1?
   Which is the better deal and why?

19. At a gas station the price of gas is $2.40 a gallon. Draw a graph to represent the relationship between the cost of gas and the volume purchase. Also write an equation using Y= MX + B form.

20. A doctor measured a patient's resting pulse rate at 80 beats per minute. Draw a graph to show the relationship between time and the number of times the patient's heart beats.
Use it to estimate how many times the patient's heart will beat in 18 minutes. Write an equation in Y = mx + b form.

21. Betsy works as waitress. Today she worked an 8 hour shift, and was paid $ 92.00. Plot a graph of the amount Betsy earns against the time she works for. Then find how much Betsy is paid per hour. Write an equation using Y = MX + B Form.

22. A machine can make 5 miles of ribbon in an hour. Graph the length of the ribbon the machine will make in eight hours. Another machine can make 8 miles of ribbon in an hour. Graph the length of the ribbon the machine will make in 8 hours. What is the difference in length for a 8 hour period between the two machines? Write an Equation in slope intercept for each machine.