

Key

### Word Problems Practice

For each situation:

1. Identify & define the independent & dependent quantities.
2. Write a function/equation to model the situation.
3. Solve the function/equation and answer question being asked.

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 a function for the water level after  $d$  days. In how many days will the water level be 26 feet?

Indep: # of days =  $d$   
 depend: water level =  $L$   
 $L = -0.5d + 34$

$$26 = -0.5d + 34$$

$$d = 16 \text{ days}$$

2. For babysitting, Nicole charges a flat fee of \$3, plus \$5 per hour. Write a function for the cost 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?

Indep: # of hours =  $h$   
 depend: cost of babysitter =  $C$   
 $C = 5h + 3$

Slope: rate per hour  
 y-int: flat fee  
 (initial charge)

$$C = 5(5) + 3$$

$$C = 25 + 3 = \$28$$

3. 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?

Indep: hours of service =  $h$   
 depend: cost of service =  $C$   
 $C = 50h + 25$

$$C = 50(8) + 25$$

$$= \$425$$

$$C = 50(10) + 25$$

$$= \$525$$

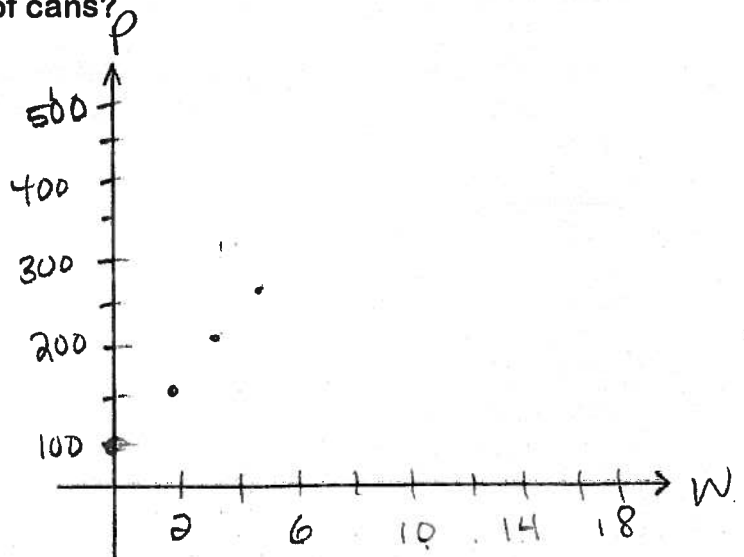
4. Rufus collected 100 pounds of aluminum cans to recycle. He plans to collect an additional 25 pounds each week. Write and graph the equation for the total pounds,  $P$ , of aluminum cans after  $w$  weeks. What does the slope and y-intercept represent? How long will it take Rufus to collect 400 pounds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

Indep: # of weeks =  $w$   
 depend: total pounds collected =  $P$   
 $P = 25w + 100$

Slope: lbs. per week  
 y-int: initial amt. of cans

$$400 = 25w + 100$$

$$w = 12 \text{ weeks}$$

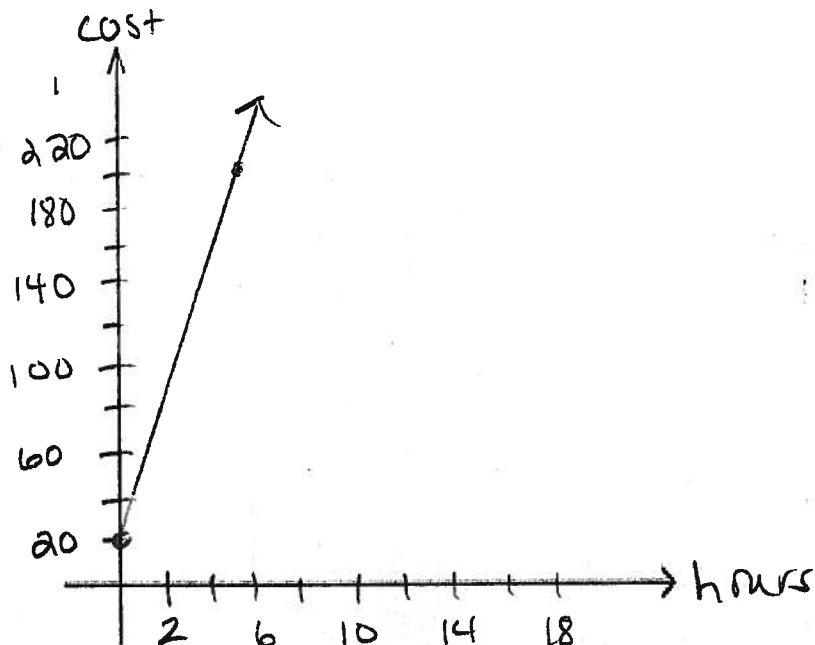


5. A canoe rental service charges a \$20 transportation fee and \$30 dollars an hour to rent a canoe. Write and graph an equation representing the cost,  $y$ , of renting a canoe for  $x$  hours. What is the cost of renting the canoe for 6 hours?

Independent: # of hours =  $x$   
 depend: cost of renting =  $y$

$$y = 30x + 20$$

$$y = 30(6) + 20 \\ = \$200$$



6. 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?

Independent: # of people =  $x$   
 depend: total cost =  $y$

$$\begin{matrix} (15, 120) \\ (25, 200) \end{matrix} \quad m = \frac{200 - 120}{25 - 15} = 8$$

Slope = cost per person

$$y - 120 = 8(x - 15)$$

$$y = 8x$$

$$y = 8(40) \\ = \$320$$

7. 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.

Independent: # of hrs. worked =  $h$   
 depend: total charge =  $C$

$$C = 150h + 250$$

$$C = 150(26) + 250 \\ = \$4150$$

8. 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.

independ: # of mins =  $m$   
depend: total gallons =  $G$

$$G = 8m + 55$$

$$G = 8(25) + 55 \\ = 255 \text{ gallon}$$

9. 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?

independ: # of videos rented =  $V$   
depend: total revenue =  $R$

$$R = 2.50V + 20$$

$$R = 2.50(15) + 20 \\ = \$57.50$$

$$67.50 = 2.50V + 20 \\ V = 19 \text{ videos}$$

10. 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?

independ: # of baskets =  $b$   
depend: total weekly cost =  $C$

$$C = 2.50b + 200$$

$$C = 2.50(40) + 200 \\ = \$300$$

11. 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.

independ: # of people =  $p$   
depend: total charge =  $C$

$$C - 180 = 2(p - 30)$$

$$C = 2p + 120$$

$$\begin{matrix} (30, 180) \\ (50, 220) \end{matrix} m = \frac{220 - 180}{50 - 30} = 2$$

base rate =  $y$ -int = \$120  
cost per person =  $m$  = \$2 per person