

# Assignment

## Write

Write a problem situation that could be modeled by a linear equation in  $x$  and  $y$  that includes the expression  $x - c$ , where  $c$  is a positive integer.

## Remember

Different forms of an equation reveal different information about a problem situation and about other representations of the problem situation.

## Practice

Write an equation to represent each situation. Define your variables and solve the equation.

1. At the Namaste Yoga Studio, the first two yoga classes are free with a registration fee of \$15. Each class after that is \$45. How many classes can you take for \$1185?
2. Clara has a coupon for \$10 off at her favorite clothing store. The coupon is applied before any discounts are taken. The store is having a sale, and offering 15% off everything. If Clara has \$50 to spend, how much can her purchases total before applying the discount and her coupon? Round to the nearest cent.
3. A dog kennel charges \$40 to board a dog for one night and \$35 per night each night after that. Henry paid a total of \$215 for dog boarding. For how many nights did Henry board his dog?
4. Drake's Drugstore is getting ready for the upcoming summer season. The manager of the store wants to add lawn chairs to the stock. He asks the buyer to determine the two lowest priced wholesalers of lawn chairs. The table shows the data that the buyer collects from two wholesalers.

Packs of Chairs	Price from Wholesaler A (dollars)	Price from Wholesaler B (dollars)
1	\$90.99	\$98.99
2	\$173.98	\$179.98
3	\$256.97	\$260.97
4	\$339.96	\$341.96

- a. Let  $p$  represent the total number of packs of chairs bought from Wholesaler A and let  $c$  represent the total cost. Write an equation to calculate the total cost of any number of packs of chairs.
- b. Let  $p$  represent the total number of packs of chairs bought from Wholesaler B and let  $c$  represent the total cost. Write an equation to calculate the total cost of any number of packs of chairs.
- c. Write the equations from parts (a) and (b) in the form  $y = ax + b$ .
- d. Calculate the cost of eight packs of chairs from each wholesaler.
- e. The manager wants to buy at least seven packs of chairs. Which wholesaler should the drugstore use this year? Explain your reasoning.

5. Geoffrey owns the Super Backyard Shed Company. He makes custom built sheds for residential homeowners, and he buys the majority of his building materials from two large home stores in the area. Both stores, Build It and All Things Home, offer reward cards for the purchase of lumber. The more boards that Geoffrey buys at one time, the more points he will earn. The points can then be used for future purchases. The table shows the number of reward points that he will earn.

Number of Boards Purchased	Store	
	Build It	All Things Home
1	10	5
2	12.5	8
3	15	11
4	17.5	14
5	20	17
6		
7		

- Complete the table to show the number of reward points earned for the purchase of 6 and 7 boards. Use the table and scenario to answer each question.
- What are the variable quantities in this problem situation? State which quantity depends on the other.
- Create graphs for each store's reward points in terms of the number of boards purchased. Identify the bounds and intervals. Be sure to label your graph clearly.
- How does the number of reward points change when the number of boards bought at Build It is increased by 1? Explain your reasoning.
- How does the number of reward points change when the number of boards bought at All Things Home is increased by 1? Explain your reasoning.
- Let  $p$  represent the number of reward points and  $b$  represent the number of boards purchased at one time. Write equations to represent the number of reward points that Geoffrey will earn in terms of the number of boards purchased from each store.
- Rewrite each equation in the form  $y = ax + b$ .
- Determine the number of points that would be earned if Geoffrey buys 12 boards at a time from each store.
- If Geoffrey earned 65 reward points, how many boards could he have bought at each store?

## Stretch

Greg needs to hire someone to clear his driveway of snow this winter season. A neighbor has a plow attached to his truck and charges \$30 for each time he plows the driveway. Mel's Landscaping runs a snow-clearing business and charges \$50 for the first time they plow and \$25 for each additional time they plow. Write and solve an equation to determine when the costs of each option are the same. Under what conditions would Greg choose his neighbor? Mel's Landscaping?

## Review

- The winner of the 95th annual hotdog eating contest consumed 207 hotdogs (and buns!) in 10 minutes. You are determined to break this record!
  - What would you have to do to break this record?
  - How many hotdogs would you have to eat every minute?
- The 96th annual contest begins at noon. Your best friend got caught in traffic and arrives halfway through the event.
  - How many hotdogs have you consumed?
  - Assuming you eat at the average rate needed, after the arrival of your best friend, how many total hotdogs will you consume in one minute? two minutes? three minutes?
  - Identify and define the independent and dependent variables with their units of measure for this situation.
  - Create a table of values for the in minutes after 12:05 PM and the number of hotdogs consumed.
  - Write an equation for calculating the value of the dependent variable when the value of the independent variable is given.
  - Use your equation to determine how long after 12:05 PM it will take you to consume 187 hotdogs.
  - Use your equation to determine when you would have consumed a total of 83 hotdogs.
  - What does the answer to part (g.) mean in this problem situation?
- Solve each equation and check your solution.
  - $42 = \frac{3}{5}x + 12$
  - $\frac{-7}{3}x - 11 = -25$