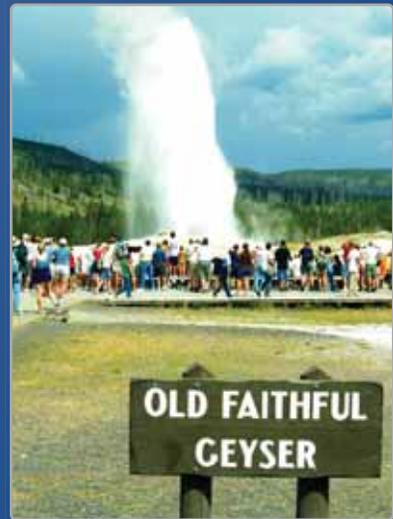


4 Writing Linear Functions

- 4.1 Writing Equations in Slope-Intercept Form
- 4.2 Writing Equations in Point-Slope Form
- 4.3 Writing Equations of Parallel and Perpendicular Lines
- 4.4 Scatter Plots and Lines of Fit
- 4.5 Analyzing Lines of Fit
- 4.6 Arithmetic Sequences
- 4.7 Piecewise Functions



Karaoke Machine (p. 220)



Old Faithful Geyser (p. 204)



Helicopter Rescue (p. 190)



Renewable Energy (p. 178)

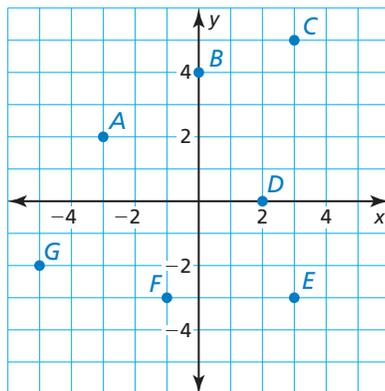


School Spirit (p. 184)

Maintaining Mathematical Proficiency

Using a Coordinate Plane

Example 1 What ordered pair corresponds to point A?



Point A is 3 units to the left of the origin and 2 units up. So, the x -coordinate is -3 and the y -coordinate is 2 .

► The ordered pair $(-3, 2)$ corresponds to point A.

Use the graph to answer the question.

1. What ordered pair corresponds to point G?
2. What ordered pair corresponds to point D?
3. Which point is located in Quadrant I?
4. Which point is located in Quadrant IV?

Rewriting Equations

Example 2 Solve the equation $3x - 2y = 8$ for y .

$$\begin{aligned} 3x - 2y &= 8 && \text{Write the equation.} \\ 3x - 2y - 3x &= 8 - 3x && \text{Subtract } 3x \text{ from each side.} \\ -2y &= 8 - 3x && \text{Simplify.} \\ \frac{-2y}{-2} &= \frac{8 - 3x}{-2} && \text{Divide each side by } -2. \\ y &= -4 + \frac{3}{2}x && \text{Simplify.} \end{aligned}$$

Solve the equation for y .

5. $x - y = 5$
6. $6x + 3y = -1$
7. $0 = 2y - 8x + 10$
8. $-x + 4y - 28 = 0$
9. $2y + 1 - x = 7x$
10. $y - 4 = 3x + 5y$

11. **ABSTRACT REASONING** Both coordinates of the point (x, y) are multiplied by a negative number. How does this change the location of the point? Be sure to consider points originally located in all four quadrants.

Mathematical Practices

Mathematically proficient students try simpler forms of the original problem.

Problem-Solving Strategies

Core Concept

Solve a Simpler Problem

When solving a real-life problem, if the numbers in the problem seem complicated, then try solving a simpler form of the problem. After you have solved the simpler problem, look for a general strategy. Then apply that strategy to the original problem.

EXAMPLE 1 Using a Problem-Solving Strategy

In the deli section of a grocery store, a half pound of sliced roast beef costs \$3.19. You buy 1.81 pounds. How much do you pay?

SOLUTION

Step 1 Solve a simpler problem.

Suppose the roast beef costs \$3 per half pound, and you buy 2 pounds.

$$\begin{aligned} \text{Total cost} &= \frac{\$3}{1/2 \text{ lb}} \cdot 2 \text{ lb} && \text{Use unit analysis to write a verbal model.} \\ &= \frac{\$6}{1 \cancel{\text{lb}}} \cdot 2 \cancel{\text{lb}} && \text{Rewrite \$3 per } \frac{1}{2} \text{ pound as \$6 per pound.} \\ &= \$12 && \text{Simplify.} \end{aligned}$$

► In the simpler problem, you pay \$12.

Step 2 Apply the strategy to the original problem.

$$\begin{aligned} \text{Total cost} &= \frac{\$3.19}{1/2 \text{ lb}} \cdot 1.81 \text{ lb} && \text{Use unit analysis to write a verbal model.} \\ &= \frac{\$6.38}{1 \cancel{\text{lb}}} \cdot 1.81 \cancel{\text{lb}} && \text{Rewrite \$3.19 per } \frac{1}{2} \text{ pound as \$6.38 per pound.} \\ &= \$11.55 && \text{Simplify.} \end{aligned}$$

► In the original problem, you pay \$11.55.

Your answer is reasonable because you bought about 2 pounds.

Monitoring Progress

1. You work $37\frac{1}{2}$ hours and earn \$352.50. What is your hourly wage?
2. You drive 1244.5 miles and use 47.5 gallons of gasoline. What is your car's gas mileage (in miles per gallon)?
3. You drive 236 miles in 4.6 hours. At the same rate, how long will it take you to drive 450 miles?