Name: ..... Date: ..... Period: .....

# Additional Practice 2.04

**1.** The given table shows the relationship between the cost and weight of seedless grapes.

**a** What is the constant of proportionality?

**b** Write an equation that represents the cost of seedless grapes $c$ given their weight $w$.

| Weight of seedless grapes (lb) | Cost of seedless grapes ($) |
|---|---|
| 2 | 5.00 |
| 0.5 | 1.25 |
| 0.25 | 0.63 |

**2.** Diego is running at a speed of 3.5 m per second. Consider using the table to help with your thinking.

**a** If he continues at this speed for 15 seconds, how far does he run?

**b** If he continues at this speed for 60 seconds, how far does he run?

**c** If he continues at this speed for $x$ seconds, how far does he run?

| Time (seconds) | Distance (meters) |
|---|---|
| 15 | |
| 60 | |
| $x$ | |

**3.** The table shows the amount of money a tourist would receive in Egyptian pounds in exchange for different amounts of money in British pounds.

**a** Complete the table with the missing values if the exchange rate is 1 British pound to 21.48 Egyptian pounds.

**b** Write an equation to represent the amount of money in Egyptian pounds $y$ the tourist receives in exchange for $x$ British pounds.

| British pounds, $x$ | Egyptian pounds, $y$ |
|---|---|
| 100 | |
| 250 | |
| | 100 |

Name: Date: Period:

**4.** Han makes fruit punch following a recipe that uses one $48$-oz can of pineapple juice to one $6$-oz can of frozen lemonade.

**a** Complete the table to determine how many ounces of frozen lemonade are needed for the given measures of pineapple juice.

**b** Write an equation to model how many ounces of pineapple juice $p$ are needed for $f$ ounces of frozen lemonade.

| Pineapple juice (oz) | Frozen lemonade (oz) |
|---|---|
| 48 | 6 |
| 16 | |
| 12 | |
| 4 | |

**5.** Bard buys a half pound of turkey breast for $\$4.99$ at the local deli.

**a** What is the price per pound of the turkey breast?

**b** Write an equation to represent the price in dollars of the turkey breast $y$ given its weight $x$ in pounds.

**c** Use your equation to complete the table.

| Weight (lb) | 0.33 | | 1.82 | |
|---|---|---|---|---|
| Price ($) | | 6.75 | | 26.94 |

**6.** Noah and Andre examine the table shown representing a proportional relationship. Noah writes the equation $y = 1.5x$ to represent the relationship between the two quantities, $x$ and $y$. Andre writes the equation $y = \left(\frac{2}{3}\right)x$ to represent the relationship between the quantities. Who is correct? Explain your thinking.

| $x$ | $y$ |
|---|---|
| 12 | 8 |
| 39 | 26 |
| 57 | 38 |

Name: ..... Date: ..... Period: .....

# Additional Practice 2.05

**1.** A mother buys lunch boxes for each of her $4$ children. She pays a total of $\$52$. If $n$ represents the number of lunchboxes and $c$ represents the total cost, in dollars, which equation gives the relationship between $n$ and $c$?

**A.** $n = 13c$

**B.** $c = n + 13$

**C.** $c = 13n$

**D.** $n = c + 13$

**Problems 2–4:** A line cook at a restaurant uses $8$ tomatoes to make $12$ bowls of salad. Assume all tomatoes and salads are about the same size.

**2.** How many bowls of salads can be made with $1$ tomato? Show or explain your thinking.

**3.** Write an equation that represents the relationship between the number of tomatoes used, $x$, and the number of bowls of salads that can be made, $y$.

**4.** If the line cook has $24$ tomatoes, how many salad bowls can she make?

**Problems 5–6:** A hardware store sells copper wire by the foot. The equation $c = 1.27f$ represents the cost $c$, in dollars, of a copper wire that is $f$ ft long.

**5.** What does the $1.27$ represent in this situation?

**6.** What is the cost of $50$ feet of copper wire? Show or explain your thinking.

**Problems 7—8:** On its way from Orlando, Florida to Los Angeles, California, a plane flew at a constant speed over Baton Rouge, Houston, San Antonio, and Phoenix.

**7.** This table shows the flight time and distance traveled for each segment on the flight. Complete the table.

| Segment | Time (hr) | Distance (mi) | Speed (mph) |
|---|---|---|---|
| Baton Rouge to Houston | 0.6 | 268 | |
| Houston to San Antonio | 2.3 | | |
| San Antonio to Phoenix | | 980 | |

**8.** Let $t$ represent the time in hours and $d$ represent the distance in miles. Write an equation that represents the distance traveled for $t$ hours.

**9.** Rodney runs at a constant speed at a recent cross country event. He ran $3\frac{1}{10}$ miles in $\frac{3}{5}$ of an hour. How far does Rodney run in one hour at this same speed?

Name: ..... Date: ..... Period: .....

# Additional Practice 2.07

**1.** Is the relationship between the weight of cherries and the cost the cherries *proportional* or *nonproportional*? Explain your thinking.

| Cherries (lb) | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Cost ($) | 9.98 | 14.97 | 19.96 | 24.95 |

**2.** Kiran, Lin, and Mai are reading a novel in their English class. Their teacher checks how many pages they have read every day for the first week. The tables show the number of pages read by each student. Determine whether each table shows a *proportional* or *nonproportional* relationship. If the relationship is proportional, determine the constant of proportionality.

**Kiran**

| Days | Pages Read |
|---|---|
| 1 | 25 |
| 2 | 49 |
| 3 | 72 |
| 4 | 94 |
| 5 | 115 |

**Lin**

| Days | Pages Read |
|---|---|
| 1 | 23 |
| 2 | 46 |
| 3 | 69 |
| 4 | 92 |
| 5 | 115 |

**Mai**

| Days | Pages Read |
|---|---|
| 1 | 20 |
| 2 | 50 |
| 3 | 75 |
| 4 | 102 |
| 5 | 115 |

**3.** The table shows the cost of renting a catering hall based on the number of guests attending.

| Number of Guests | Cost ($) |
|---|---|
| 75 | 8,250 |
| 100 | 11,000 |
| 150 | 16,500 |

**a** Is there a *proportional* or *nonproportional* relationship between the cost and the number of guests? Explain your thinking.

**b** Predict the cost of renting the catering hall if 200 guests are attending.

Name: Date: Period:

**4.** The table represents different ways you can purchase tickets at a carnival. Select *all* statements that are true based on the relationship between the price and the number of carnival tickets.

| Number of tickets | Price ($) |
|---|---|
| 5 | 2 |
| 20 | 8 |
| 100 | 40 |

- ☐ **A.** The table represents a nonproportional relationship.
- ☐ **B.** The table has equivalent ratios.
- ☐ **C.** The price per ticket is the same regardless of the number of tickets purchased.
- ☐ **D.** The constant of proportionality to determine the price is $2.50.
- ☐ **E.** The constant of proportionality to determine the price is $0.40.
- ☐ **F.** There is no constant of proportionality.

**5.** Shawn determines the pattern in the table shown and concludes there is a proportional relationship between the quantities. Do you agree with Shawn? Explain your thinking.

| Quantity 1 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Quantity 2 | 2 | 4 | 8 | 16 |

**6.** Clare buys 3 pieces of Fruit A and 3 pieces of Fruit B at her local farmer's market. The tables show the total weight and price as each fruit is added to the scale at checkout.

| Number of Fruit A | Total Weight (oz) | Price ($) |
|---|---|---|
| 1 | 4.2 | 0.42 |
| 2 | 8.7 | 0.87 |
| 3 | 13.4 | 1.34 |

| Number of Fruit B | Total Weight (oz) | Price ($) |
|---|---|---|
| 1 | 2.6 | 0.50 |
| 2 | 3.0 | 1.00 |
| 3 | 2.9 | 1.50 |

**a** Is the relationship between the price of fruit A and the number of fruits purchased *proportional* or *nonproportional*? What about the relationship between the price of fruit A and total weight?

**b** Which fruit's price is determined by the number of fruits purchased? Which is determined by total weight? Explain your thinking.

Name: ..... Date: ..... Period: .....

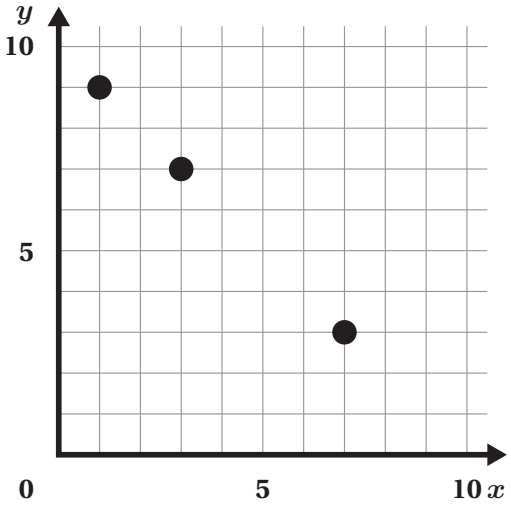
# Additional Practice 2.08

**1.** Which of the following statements about the graph of a proportional relationship are true? Select *all* that apply.

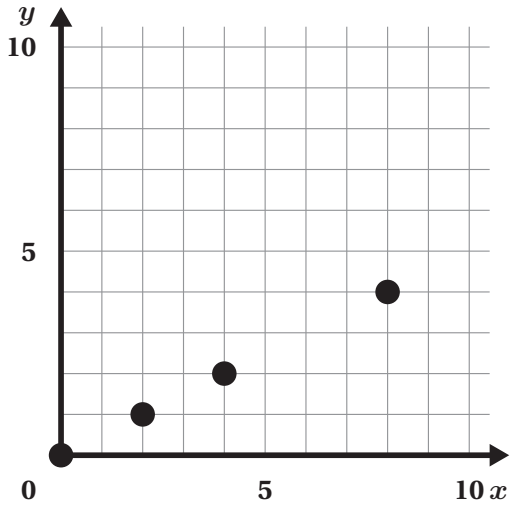
- ☐ **A.** The points on the graph form a curve.
- ☐ **B.** The points on the graph form a straight line.
- ☐ **C.** The graph goes through the origin.
- ☐ **D.** The graph must be a solid line.
- ☐ **E.** The graph could be a series of points.

**Problems 2–5:** Determine if each graph or table represents a proportional relationship. Explain your thinking.

**2.**

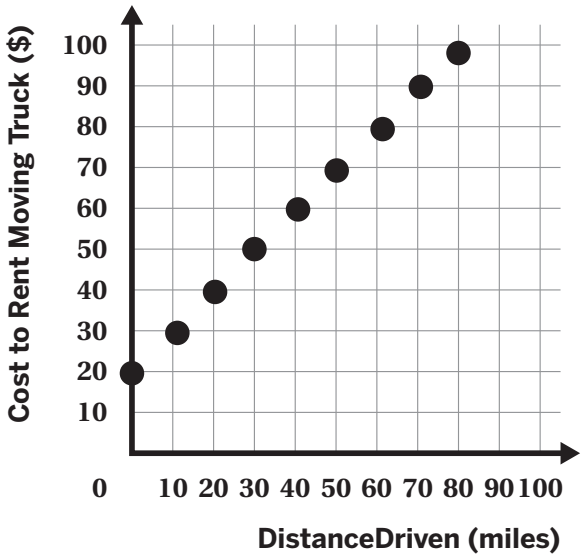



**3.**



Name: Date: Period:

**4.** The graph shows the relationship between the total cost of renting a moving truck and the number of miles the truck is driven. Explain why this relationship is not proportional based on the graph.




**5.** Complete the table below so that it shows a proportional relationship.

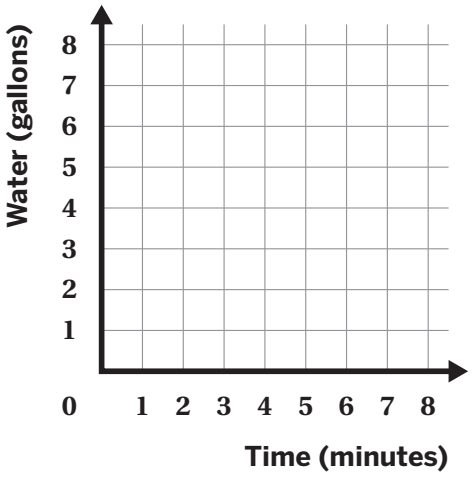
| $x$ | 0 | 2 | 4 | 6 |
|---|---|---|---|---|
| $y$ | | | 12 | |

**6.** Fiona earned $\$50.00$ for mowing $4$ lawns. At this same rate, how much will she earn if she mowed $6$ lawn? Explain your thinking.

**7.** A bathtub is being filled at a rate of $1\frac{1}{3}$ gallons of water per minute. The table shows how much water is in the bathtub after several minutes have passed.

| Time (minutes) | 1 | 2 | 3 | 5 |
|---|---|---|---|---|
| Water (gallons) | $1\frac{1}{3}$ | $2\frac{2}{3}$ | 4 | $5\frac{1}{3}$ |

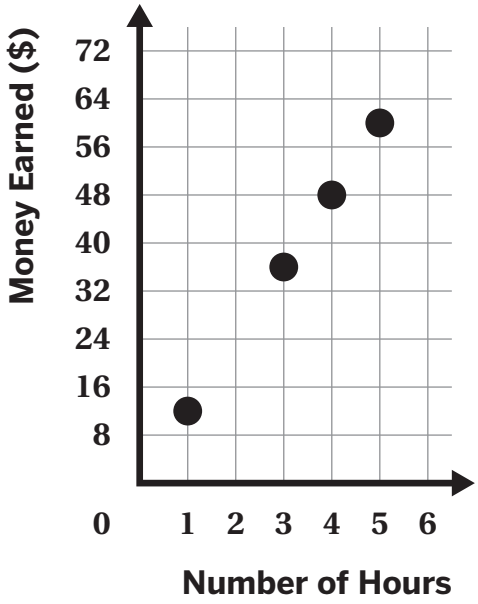
Graph the ordered pairs to determine whether the relationship between time and the amount of water in the bathtub is proportional.
Explain your thinking.



Name: ..... Date: ..... Period: .....

# Additional Practice 2.09

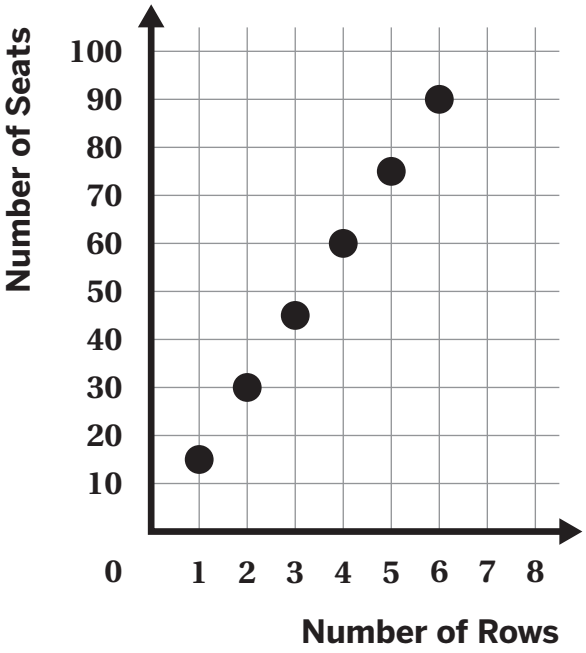
**1.** Here is a proportional relationship between the number of hours Andre babysits and the amount of money he earns.




**a** What is the constant of proportionality in this relationship?

**b** Write an equation that represents this relationship.

**2.** The graph represents the relationship between the number of rows and the number of seats in a school auditorium.

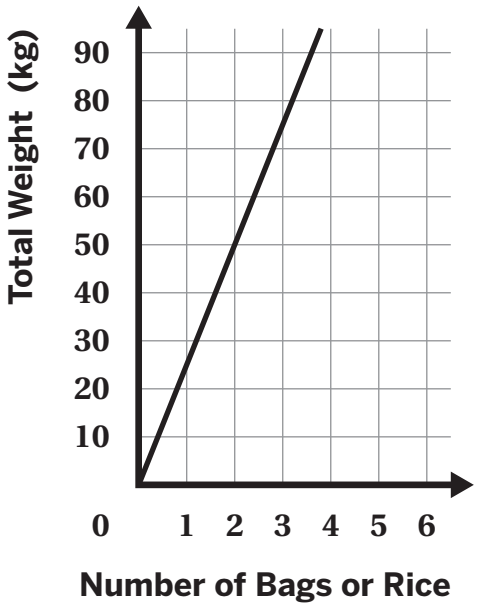



**a** What does the point (5, 75) represent?

**b** What is the constant of proportionality in this relationship?

Name: Date: Period:

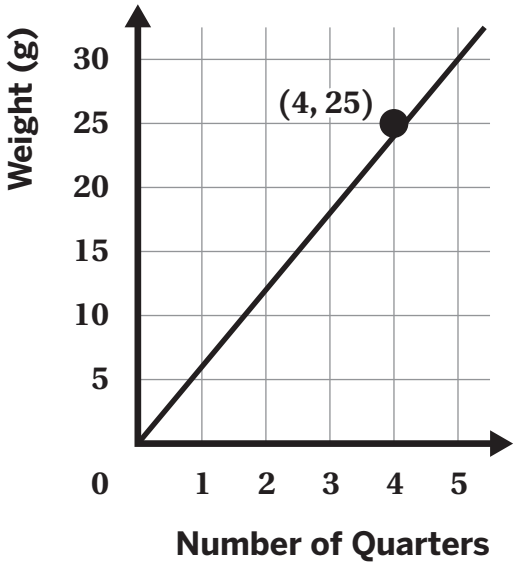
**3.** The graph shows the relationship between the number of bags of rice in stock at a grocery store and their total weight, in kilograms.




**a** Determine the constant of proportionality and explain its meaning.

**b** Label the point $(1, k)$ on the graph.

**4.** There is a proportional relationship between the number of quarters $q$ and their total weight $w$ in grams. 4 quarters weigh a total of 25 grams. The point $(4, 25)$ is shown on the graph.




**a** What is the constant of proportionality?

**b** What does the constant of proportionality represent in this context?

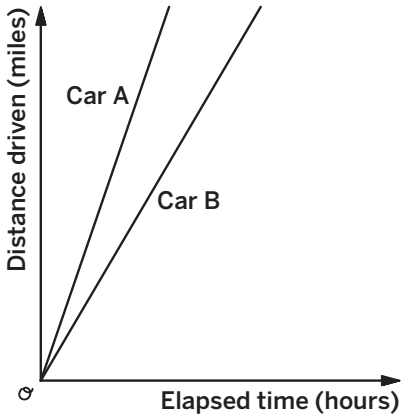
**c** Plot at least two more points that show the same relationship on the graph, and label the points with their coordinates.

**d** Using the constant of proportionality from part a, write an equation that represents the relationship between $w$ and $q$.

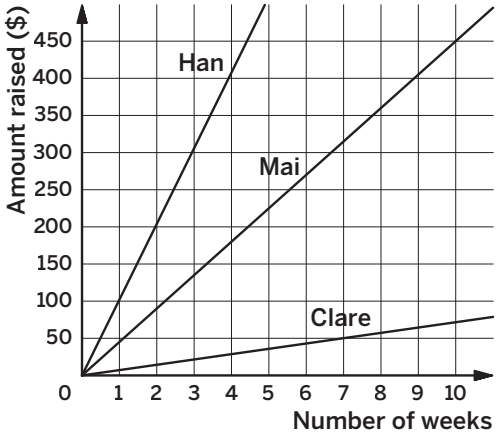
Name: ..... Date: ..... Period: .....

# Additional Practice 2.10

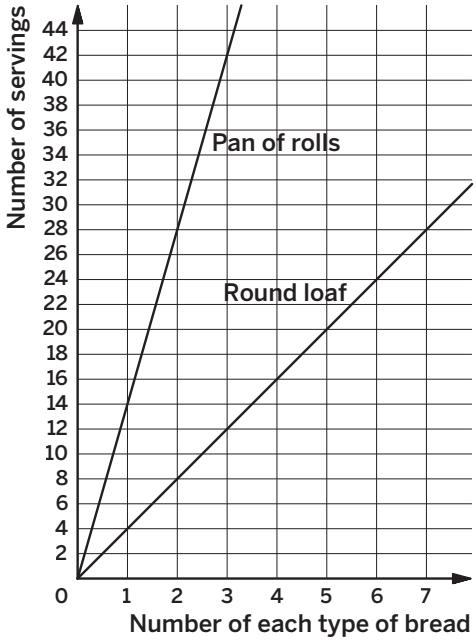
**1.** The graph shows two lines that represent the distance driven by two cars at a constant speed over time. Which car was driven at a faster speed?




**2.** The graph shows three lines that represent the amount of money raised by three different students during a school fundraiser over several weeks. Order their names from the student who raised money at the slowest rate to the one who raised money at the fastest rate.



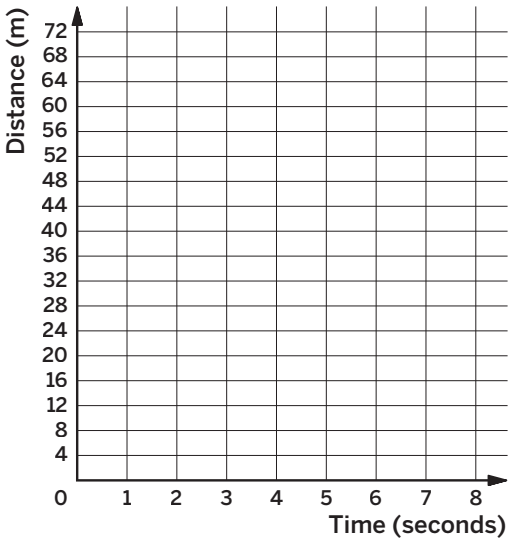

**3.** A bakery sells round loaves of bread and pans of rolls. The graph shows the relationship between the number of each type of bread and the number of servings. Select *all* the statements that are true, based on the graph.




- ☐ **A.** Both lines show a proportional relationship between the number of each type of bread and the number of servings.
- ☐ **B.** 2 pans of rolls can serve 28 people.
- ☐ **C.** There are 4 servings in 16 round loaves.
- ☐ **D.** There are more servings in a round loaf than in a pan of rolls.
- ☐ **E.** A round loaf serves less people than a pan of rolls.
- ☐ **F.** The line that represents the number of servings in a pan of rolls has a greater constant of proportionality.

Name: ..... Date: ..... Period: .....

**4.** Bard and Priya race each other on the school track. Priya takes 5 seconds to run 35 m and Bard takes 4 seconds to run 32 m. Both students run at a constant rate.

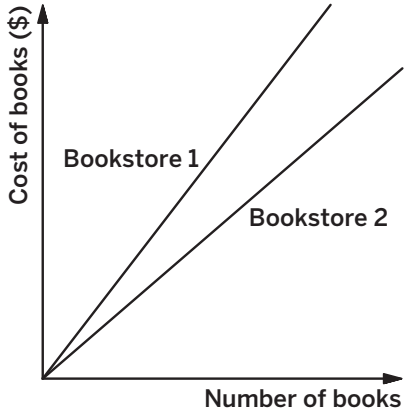



**a** Graph the two lines that represent the distance that Bard and Priya run on the track. Label each line with the appropriate name.

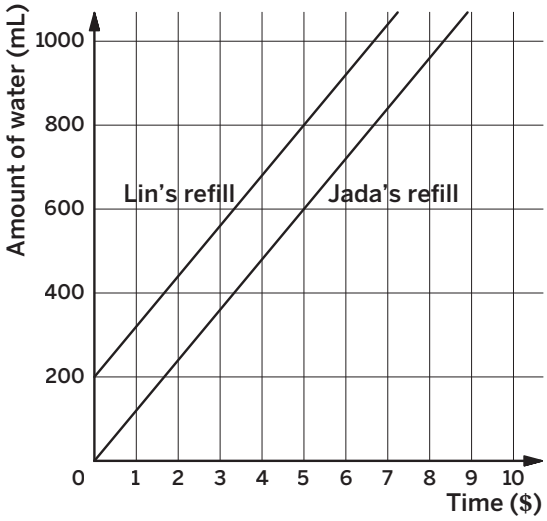
**b** For each line, label the point with coordinates $(1, k)$ and determine the value of $k$.

**c** Which student won the race? Explain your thinking.

**5.** A teacher needs to order a class set of books for his class. The graph shows two lines that represent the total cost of the books at two different bookstores. From which bookstore should the teacher purchase his class set of books? Explain your thinking.




**6.** Jada and Lin refill their water bottles at a drinking fountain after basketball practice. The graph represents the amount of water in their bottles as they fill it up at the drinking fountain.




**a** Which line represents a proportional relationship between time and the amount of water in the bottle? Explain your thinking.

**b** What does the point $(0, 0)$ mean on the line representing Jada's refill?

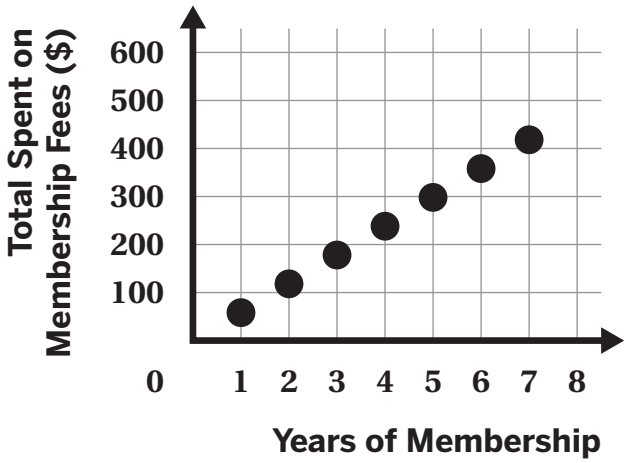
**c** What does the point $(0, 200)$ mean on the line representing Lin's refill?

**d** Which line represents the bottle that was filled at a faster rate? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 3.01

**Problems 1–4:** A wholesale store charges an annual membership fee for its customers to shop there. The graph shows the relationship between the total amount spent on membership fees and the number of years that a customer is a member.



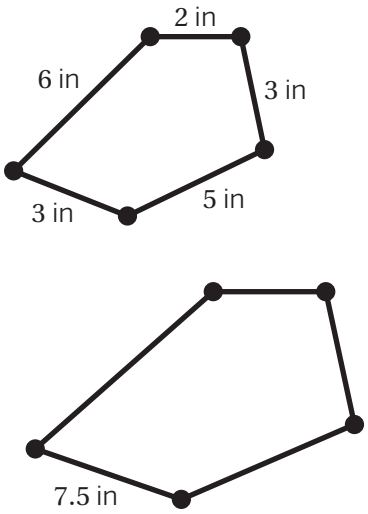

**1.** Explain how the graph shows that the relationship between the number of years a customer has been a member and the total amount of money spent on membership fees is proportional.

**2.** Calculate a constant of proportionality for this relationship.

**3.** Write an equation that relates years of membership, $m$, to the total amount of money spent on membership fees, $C$.

**4.** If a customer paid a total amount of $\$840$ in membership fees, for how many years have they been a customer?

**5.** These polygons are scaled copies. Determine the perimeter of the larger polygon. Show or explain your thinking.




**Problems 6–9:** The relationship between the number of guests $g$ invited to a wedding reception and the number of tables $t$ that are needed to accommodate them is proportional.

**6.** Complete the table.

| Number of guests, $g$ | Number of tables, $t$ |
|---|---|
| 80 | 10 |
| | 15 |
| 200 | |
| | 35 |

**7.** What are the two constants of proportionality for this relationship?

**8.** Write two equations using the constants of proportionality from Problem 7.

**9.** Use one of your equations from Problem 8 to determine how many tables will be needed to accommodate 300 guests.

Name: ..... Date: ..... Period: .....

# Additional Practice 3.03

**1.** The tires on a sports car are $2.5$ feet tall. Which part of a circle does this measurement represent?

**A.** Diameter

**B.** Radius

**C.** Circumference

**D.** Area

**2.** Select *all* the possible values for the circumference of a circle with a diameter of $8$ in.

☐ **A.** $21$

☐ **B.** $25$

☐ **C.** $26$

☐ **D.** $32$

☐ **E.** $38$

☐ **F.** $40$

**3.** Elena measured the diameter and circumference of several circular objects and recorded her measurements in the table. Fill in the missing values of the table.

| Real World Object | Radius (mm) | Diameter (mm) | Circumference (mm) |
|---|---|---|---|
| Button | 6 | | |
| Quarter | | | 75 |
| Cucumber Slice | | 38 | |
| Ring | | | 52 |

**4.** Elena is painting on a circular canvas. The circumference of the canvas is $16\pi$ inches. Determine the diameter of the canvas Elena is painting on.

**5.** Determine whether each pair of measurements could be a reasonable approximation for the diameter and circumference of a circle. Show or explain your thinking.

**a** 11 in. and 45 in.

**b** 20 in. and 47 in.

**c** 16 in. and 50 in.

**6.** Complete the table with a possible length for each diameter or circumference, given the other measurement. Verify your answers by calculating the ratio of circumference to diameter for each pair of lengths.

| Diameter | Circumference | $\frac{\text{Circumference}}{\text{Diameter}}$ |
|---|---|---|
| 9 | | |
| 48 | | |
| | 116 | |

Name: ..... Date: ..... Period: .....

# Additional Practice 3.04

**1.** Determine the *exact* measurements of the diameter and the radius if the circumference of a circle is $7\pi$.

**A.** Radius: 7, Diameter: 14

**B.** Radius: 7, Diameter: 3.5

**C.** Radius: 3.5, Diameter: 7

**D.** Radius: 1.75, Diameter: 3.5

**2.** Determine the exact measurements of the diameter and the radius if the circumference of a circle is 24.

**A.** Radius: 12, Diameter: 24

**B.** Radius: $\frac{6}{\pi}$, Diameter: $\frac{12}{\pi}$

**C.** Radius: $\frac{24}{\pi}$ Diameter: $\frac{48}{\pi}$

**D.** Radius: $\frac{12}{\pi}$, Diameter: $\frac{24}{\pi}$

**3.** For each measurement, determine whether it represents the *radius, diameter,* or *circumference*. Place a check mark in the appropriate column and record the measurement in that cell. Then determine the *exact* lengths for the other two measurements of the circle.

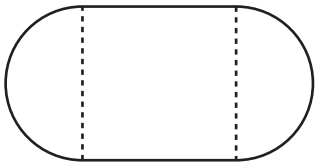
| | Radius | Diameter | Circumference |
|---|---|---|---|
| The decorative border around a watch face measures 85 mm. | | | |
| The center to the edge of a circular pond measures 19 m. | | | |
| The length across the top of a vinyl record measures 25.4 cm. | | | |

**4.** For each measurement, determine whether it represents the *radius, diameter,* or *circumference*. Place a checkmark in the appropriate column and record the measurement in that cell. Then determine the *exact* lengths for the other two measurements of the circle.

| | Radius | Diameter | Circumference |
|---|---|---|---|
| The center to the edge of a quarter measures 12 mm. | | | |
| The rubber around a bike tire measures 86 in. | | | |
| The length across a circular slice of cucumber measures 1.3 in. | | | |

Name: ..... Date: ..... Period: .....

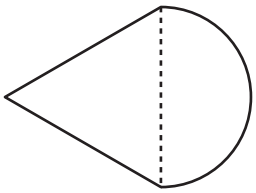
**5.** A semicircle is joined to a square with side lengths of $8$ units. Noah tried to determine the perimeter of the resulting shape. Determine and correct the mistake that Noah made in his work.



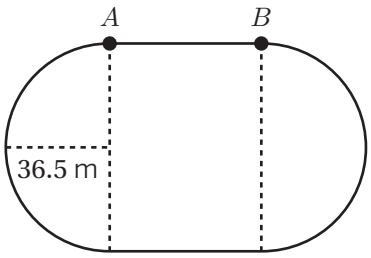
**Noah's work:**
$2$ semicircles $+$ square
$1$ circle $+$ square

$\pi \cdot d + 4 \cdot s$
$= \pi(8) + 4(8)$
$= 8\pi + 32$

**6.** A semicircle is joined to an equilateral triangle with side lengths of $14$ units. Determine the *exact* perimeter of the resulting shape. Show your thinking.



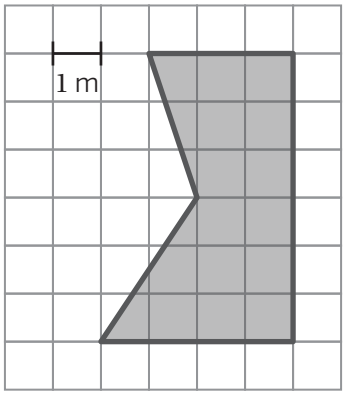
**7.** A track is in the shape of a rectangle with a semicircle on each end. If the distance around the entire track is $400$ m, determine the *exact* distance from point $A$ to point $B$. Show your thinking.



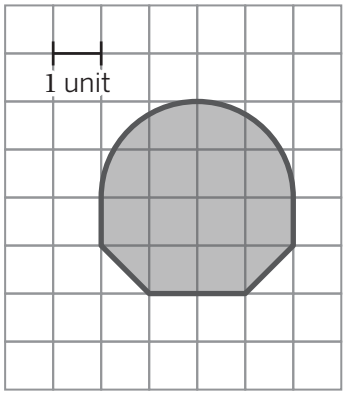
Name: ..... Date: ..... Period: .....

# Additional Practice 3.05

**1.** What is the area of this shape? Show your thinking.

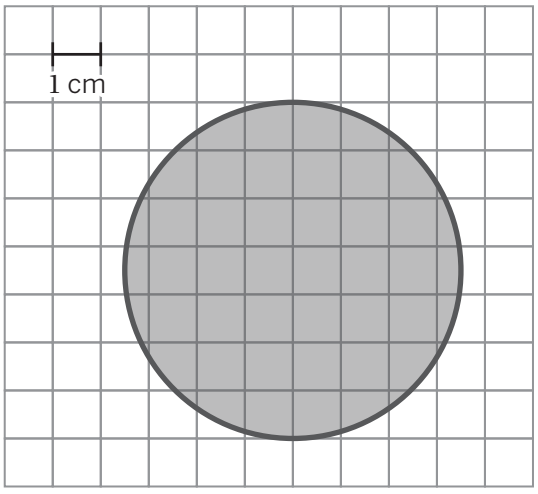



**2.** Here is a diagram of two squares and a shape. Explain why the area of the figure is more than 8 square units but less than 16 square units.

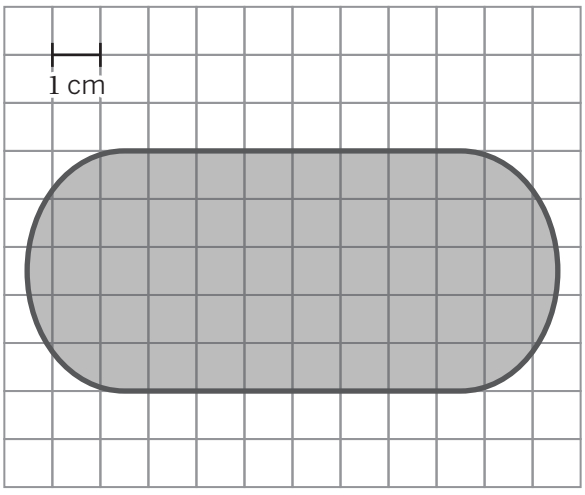



**Problems 3–4:** Estimate the area of each shape.

**3.**



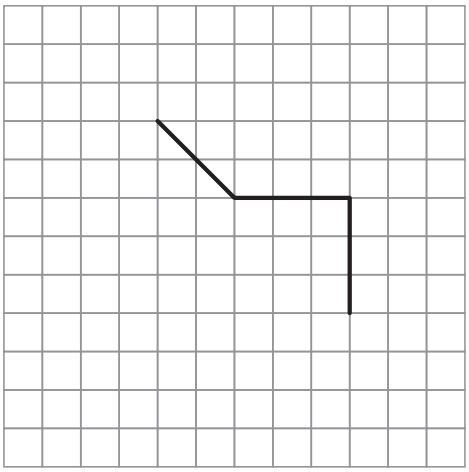

**4.**



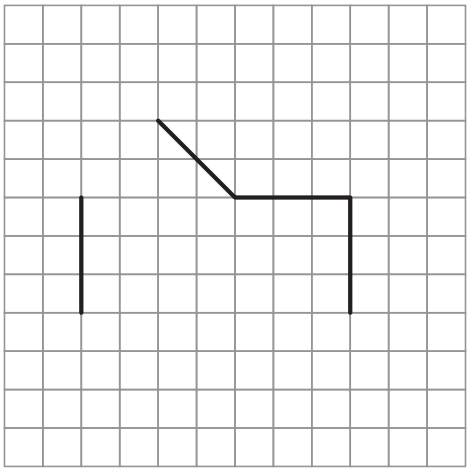
Name: ..... Date: ..... Period: .....

**Problems 5–6:** Priya started drawing a polygon.

**5.** Complete Priya's drawing so that the polygon has an area of 25 square units.



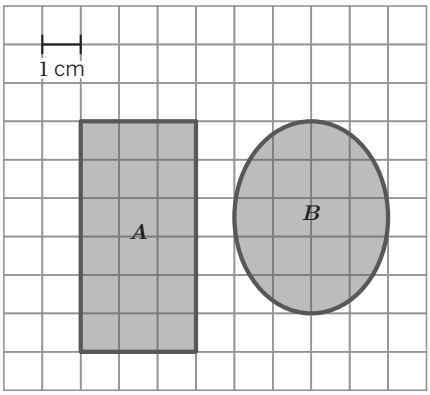
**6.** Complete Priya's drawing in a different way so that the polygon has an area of 25 square units.



**7.** Which shape has a larger area? Circle one.

Shape $A$ Shape $B$ They are the same.

Show or explain how you know.



Name: ..... Date: ..... Period: .....

# Additional Practice 3.07

**1.** A circle's radius is $5$ cm. Which of the following is *true*?

**A.** The circle's area is exactly $5\pi$ cm$^2$

**B.** The circle's area is exactly $25\pi$ cm$^2$.

**C.** The circle's area is exactly $10\pi$ cm$^2$.

**D.** The circle's area is exactly $15\pi$ cm$^2$.

**2.** A circle's diameter is $12$ in. Which of the following is *true*?

**A.** The circle's area is approximately $37.7$ in$^2$.

**B.** The circle's area is approximately $452.4$ in$^2$.

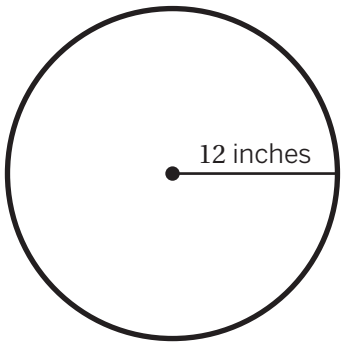
**C.** The circle's area is approximately $18.85$ in$^2$.

**D.** The circle's area is approximately $113.1$ in$^2$.

**3.** A circle has a diameter of $102$ in. What is the *exact* area of the circle, in terms of $\pi$? Show or explain your thinking.

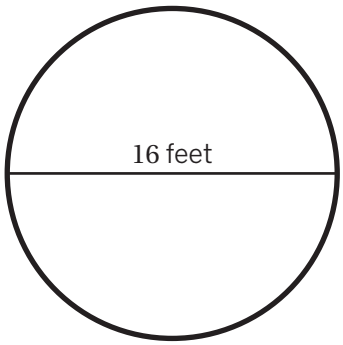
**Problems 4–5:** Find the exact area of each circle.

**4.**



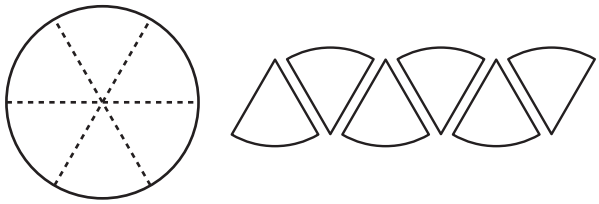
Name: Date: Period:

**5.**




**6.** The radius of Mars is approximately $3{,}390$ kilometers. The Martian dichotomy divides the northern and southern hemispheres. Is the circumference of a circle or the area of a circle more useful for finding the length of the Martian dichotomy?

**7.** The circle shown is divided into $6$ equal wedges which are rearranged. Let $r$ represent the radius of the circle. The circle's circumference is represented by the expression $2\pi r$.

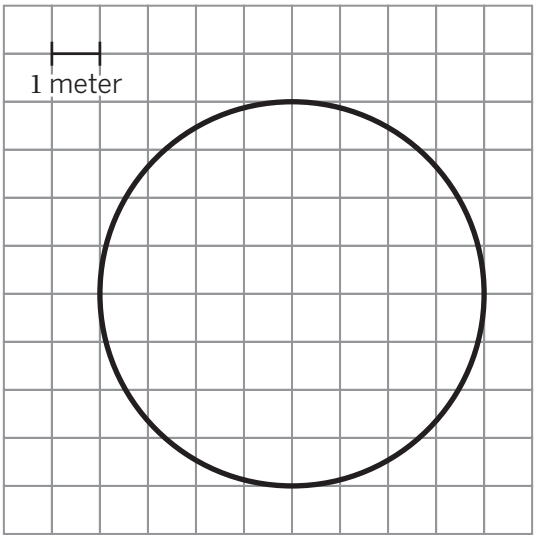


Explain how the image helps to understand why the area of the circle is represented by the expression $\pi r^2$.

Name: ..... Date: ..... Period: .....

# Additional Practice 3.08

**Problems 1–2.** Here is a diagram of a circle. It represents a circular road in a town. Within the circular road is a park.




**1.** Estimate the area of the park.

**2.** Estimate the length of the circular road.

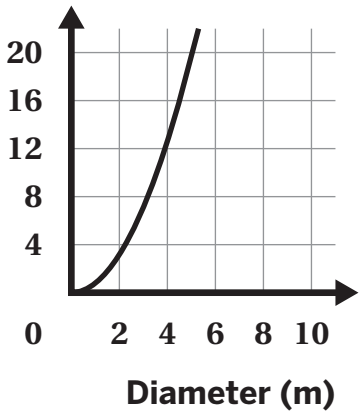
**3.** Are the radius and area measurements of a circle proportional to each other?

Yes No Maybe

**4.** Write an equation that relates radius and diameter.

Name: ..... Date: ..... Period: .....

**5.** Which phrase describes the relationship within a circle that this graph represents?



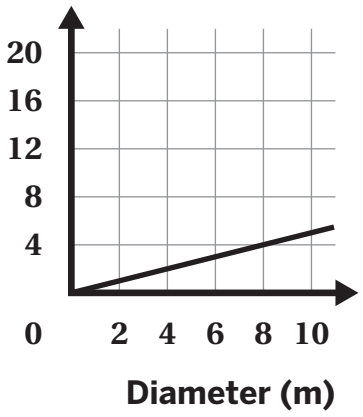

**A.** Radius vs. diameter

**B.** Circumference vs. diameter

**C.** Area vs. diameter

**D.** Circumference vs. area

**6.** Which phrase describes the relationship within a circle that this graph represents?




**A.** Radius vs. diameter

**C.** Circumference vs. diameter

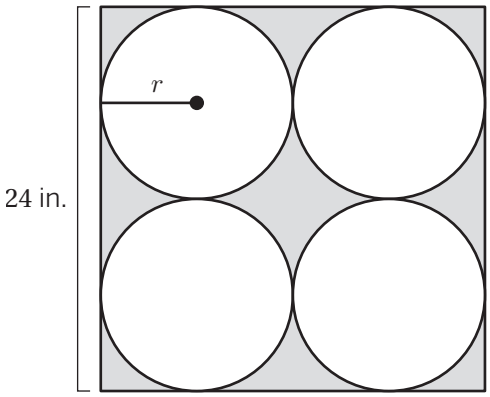
**B.** Area vs. diameter

**D.** Circumference vs. area

Name: ..... Date: ..... Period: .....

# Additional Practice 3.09

**1.** Four circles are arranged in a square as shown. What is the radius of each circle?



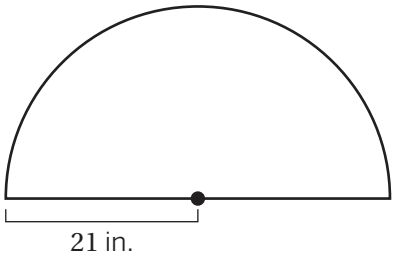

**A.** $r = 3$ in.

**B.** $r = 4$ in.

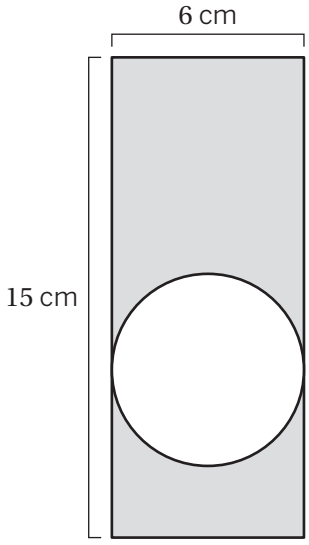
**C.** $r = 6$ in.

**D.** $r = 12$ in.

**2.** Calculate the area of the semicircle. Show or explain your thinking.



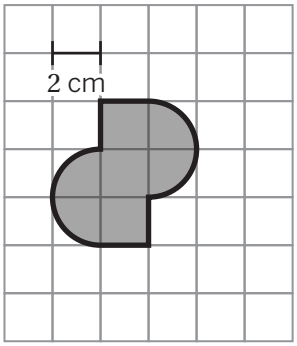

**3.** Calculate the *exact* area of the shaded region. Express your answer in terms of π. Show or explain your thinking.



**4.** A circle with a 32 in. diameter is folded in half and then folded in half again in the other direction. What is the *exact* area of the resulting shape? Express your answer in terms of $\pi$. Show or explain your thinking.

**5.** A circle with a 12-inch long diameter is folded in half and then folded in half again. What is the exact area of the new shape? Write your answer in terms of $\pi$, and explain your thinking.

**6.** Calculate the area of this shape.



Name: ..... Date: ..... Period: .....

# Additional Practice 3.08

**1.** A package of 12 water bottles costs $1.32. How much would a package of 40 water bottles cost at the same price per bottle? Show or explain your thinking.

**2.** A package of 2 mechanical pencils costs $3.98. How much would a package of 8 pencils cost at the same price per pencil? Show or explain your thinking.

**3.** A package of 32 juice boxes costs $10.88. How much would a package of 10 juice boxes cost at the same price per juice box? Show or explain your thinking.

**4.** A grocery store sells a box of 6 protein bars for $7.14. Using the same price per protein bar, determine the cost of the following. Show your thinking.

**a** 8 protein bars

**b** 15 protein bars

**c** 20 protein bars

**d** 32 protein bars

**e** 4 protein bars

Name: Date: Period:

**5.** After 2.5 hours, Jada has traveled 160 miles. If she travels at a constant speed, how far will she have traveled after:

**a** 45 minutes?

**b** $1\frac{1}{2}$ hours?

**c** 4 hours?

**d** 5.5 hours?

**6.** It takes Diego 16 minutes to read 9 pages. How long will it take Diego to read 36 pages? Show your thinking.

**7.** Order these animals from heaviest to lightest. Show your thinking. **Hint:** 1 lb = 16 oz, 1 kg ≈ 2.2 lb, and 1 ton = 2,000 lb.

| Animal | Weight |
|---|---|
| Giraffe | 816 kg |
| Hippopotamus | 3,300 lb |
| Lion | 6,720 oz |
| Rhinoceros | $2\frac{1}{2}$ tons |

**8.** A 1-gallon container of milk costs $3.20. Han claims that an 80-oz container should cost $1.60 for the unit rate to be the same for both containers. Is Han correct? Explain your thinking. **Hint:** 128 oz = 1 gallon.

Name: ..... Date: ..... Period: .....

# Additional Practice 3.09

**1.** Use benchmark percentages to help you determine each percent of 400.

**a** What is 50% of 400?

**b** What is 10% of 400?

**c** What is 1% of 400?

**d** What is 5% of 400?

**e** What is $\frac{1}{2}$% of 400?

**f** What is 150% of 400?

**2.** Use benchmark percentages to help you determine each percent of 150.

**a** What is 50% of 150?

**b** What is 10% of 150?

**c** What is 1% of 150?

**d** What is 5% of 150?

**e** What is $\frac{1}{2}$% of 150?

**f** What is 150% of 150?

**Han surveyed all 600 students in his school to determine how many siblings each student has. Here are the results of the survey. Use this information for Problems 3 and 4.**

- 30 students have 0 siblings.
- 180 students have 1 sibling.
- 150 students have 2 siblings.
- 120 students have 3 siblings.
- 72 students have 4 siblings.
- 48 students have 5 or more siblings.

**3.** What percent of students have each number of siblings? Complete the table.

| | 0 siblings | 1 sibling | 2 siblings | 3 siblings | 4 siblings | 5 or more siblings |
|---|---|---|---|---|---|---|
| Percent (%) | | | | | | |

**4.** Assume the school's percentages are representative of all middle schoolers in the entire school district. If there are $1{,}500$ middle school students in the district, how many students are expected to have each number of siblings? Complete the table.

| | 0 siblings | 1 sibling | 2 siblings | 3 siblings | 4 siblings | 5 or more siblings |
|---|---|---|---|---|---|---|
| Number of students | | | | | | |

**5.** How could you determine $25\%$ of any number? Select *all* that apply.

- ☐ **A.** Multiply the number by $0.25$.
- ☐ **B.** Divide the number by $\frac{1}{4}$.
- ☐ **C.** Divide the number by $0.25$.
- ☐ **D.** Divide the number by $4$.
- ☐ **E.** Multiply the number by $\frac{1}{4}$.

**6.** Which of the following tells you how to determine $150\%$ of any number?

**A.** Multiply the number by $150$.

**B.** Multiply the number by $15$.

**C.** Multiply the number by $1.5$.

**D.** Multiply the number by $0.15$.

**7.** Priya says that to determine $75\%$ of a number, you divide the number by $4$ and then multiply the number by $3$. For example, she says that $75\%$ of $40$ is $30$ because $(40 \div 4) \cdot 3 = 30$. Does Priya's method always work? Explain your thinking.

**8.** Jada and Diego each answer this question: $8$ is what percent of $10$?

- Jada says, "$8$ is $80\%$ of $10$."
- Diego says, "$8$ is $20\%$ of $10$."

Who is correct? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 3.11

**1.** There are 200 campers attending summer camp this year. 25% of the campers have attended in previous years. Draw a tape diagram to show how many campers have attended previously and how many have not attended previously.

**2.** Of the 200 campers, 40% of campers have birthdays in the spring.

**a** How many campers have birthdays in the spring? Show or explain your thinking.

**b** How many campers do not have birthdays in the spring? Show or explain your thinking.

**3.** Several campers were surveyed about their favorite camp activity. 11 campers chose archery and 6 campers chose swimming. The campers who chose archery make up 55% of those surveyed, the campers who chose swimming make up 30% of those surveyed, and the rest chose basketball.

**a** What percent of the campers chose basketball? Show or explain your thinking.

**b** How many total campers were surveyed? Show or explain your thinking.

**4.** The camp is in New York. Of the $45$ camp counselors, $80\%$ are from out of state and the rest are from New York.

**a** What percent of the camp counselors are from New York? Show or explain your thinking.

**b** How many camp counselors are from out of state? Show or explain your thinking.

**For Problems 5–7, tickets to a school play were sold to sixth, seventh, and eight graders.**

**5.** Of the tickets purchased by eighth graders, $33$ tickets were sold for Friday night's performance. If this represents $60\%$ of the tickets sold to eighth graders, how many eighth graders purchased tickets? Show or explain your thinking.

**6.** Of the tickets purchased by seventh graders, $24$ were sold for Thursday night's performance. If this represents $30\%$ of the tickets sold to seventh graders, how many seventh graders purchased tickets? Show or explain your thinking.

**7.** Of the tickets purchased by sixth graders, $96$ were sold for Saturday night's performance. If this represents $80\%$ of the tickets sold to sixth graders, how many sixth graders purchased tickets? Show or explain your thinking.

**8.** A store sells two different-sized boxes of the same cereal. Box A contains $10$ cups of cereal. Box B contains $30\%$ more cereal than Box A. How many cups of cereal does Box B contain? Show or explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 3.12

**1.** Which equations could be used to determine the missing number: 75 is 20% of what number? Select *all* that apply.

- ☐ **A.** $75 = \frac{2}{100} \cdot x$
- ☐ **B.** $20 = \frac{75}{100} \cdot x$
- ☐ **C.** $75 = \frac{20}{100} \cdot x$
- ☐ **D.** $75 = 0.2 \cdot x$
- ☐ **E.** $20 = 0.75 \cdot x$

**2.** Which equations could be used to determine the missing number: What number is 5% of 88? Select *all* that apply.

- ☐ **A.** $x = \frac{5}{100} \cdot 88$
- ☐ **B.** $\frac{x}{5} = \frac{88}{100}$
- ☐ **C.** $0.05x = 88$
- ☐ **D.** $0.05 \cdot 88 = x$
- ☐ **E.** $\frac{x}{88} = \frac{5}{100}$

**3.** Determine each missing value. Show your thinking.

**a** What number is 12% of 125?

**b** 18 is 90% of what number?

**c** 120% of what number is 48?

**4.** Tyler and Andre scored 42% of their team's points at yesterday's basketball game. If their team scored 50 points, how many points did Tyler and Andre score? Explain your thinking.

**5.** A bakery sells 150 muffins on Tuesday. If 36% of the muffins were sold in the afternoon, how many muffins were sold in the afternoon? Explain your thinking.

**6.** An item is sold at two different stores. Which option is a better deal? Explain your thinking.

| | |
|---|---|
| Store A | The item costs $54.95. There is a coupon for 20% off the price of the item. |
| Store B | The item costs $59.96. There is a coupon for 25% off the price of the item. |

**7.** An item is on sale for 30% off and then it is reduced an additional 20% off. Another item is 50% off. The original price of the two items is the same. Lin said that the sale price of the two items is the same. Do you agree with Lin? Include an example to explain your thinking.

**8.** An item is sold at two different stores. Mai says that the price of an item at Store A is a better deal. Do you agree with Mai? Explain your thinking.

| | |
|---|---|
| Store A | The item costs $75. The sale sign says, "Buy 1, get 1 half off." Two items are purchased. |
| Store B | The item costs $85. The sale sign says,"Buy 2, get 30% off the total." Two items are purchased. |

Name: ..... Date: ..... Period: .....

# Additional Practice 3.13

**1.** Complete each percentage statement.

**a** 20% of 80 is .....

**b** 150% of 84 is .....

**c** 5% of 420 is .....

**2.** Complete each percentage statement.

**a** .....% of 20 is 15.

**b** .....% of 170 is 68.

**c** .....% of 20 is 25.

**3.** Complete each percentage statement.

**a** 14% of ..... is 70.

**b** 225% of ..... is 81.

**c** 10% of ..... is 100.

**4.** On a sixth grade field trip, there are 5 chaperones for every 30 students. There are 175 people on the field trip.

**a** How many chaperones are on the field trip?

**b** How many sixth graders are on the field trip?

**c** What percent are chaperones? **Hint:** Round to the nearest whole percent.

**d** What percent are sixth graders? **Hint:** Round to the nearest whole percent.

**5.** Andre conducts a survey of $1{,}450$ people to find out about their favorite type of vacation. $56\%$ of those surveyed prefer a beach vacation, $28\%$ prefer a vacation in the mountains, and $16\%$ prefer going to amusement parks for vacation.

**a** How many people prefer a beach vacation?

**b** How many people prefer a mountain vacation?

**c** How many people prefer going to an amusement park for vacation?

**6.** A bakery made $1{,}175$ bagels. $48\%$ are onion bagels, $36\%$ are sesame bagels, and $16\%$ are raisin bagels.

**a** How many onion bagels were made?

**b** How many sesame bagels were made?

**c** How many raisin bagels were made?

**7.** A bakery sells $12$ corn muffins for every $4$ lemon poppy seed muffins. On Saturday, the bakery sold $192$ muffins.

**a** How many corn muffins were sold?

**b** How many lemon poppy seed muffins were sold?

**c** What percent of all the muffins sold were corn muffins?

**d** What percent of all the muffins sold were lemon poppy seed muffins?

**8.** Han says that $429$ is $78\%$ of $550$. Is Han correct? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 4.02

**1.** Write each percent increase or decrease as a percentage of the original amount.

**a** A store manager decides on a 10% markdown on the retail price of the last pair of jeans in stock.

**b** Tickets to a pro basketball game are resold online with a 50% markup from their original price.

**c** The number of students enrolled at a local university dropped 14.5% from last year.

**2.** At the start of the day, there was 12 inches of snow on the ground. Since then, 20% of the snow has melted. Which expression represents the inches of snow left on the ground?

**a.** $0.2 \cdot 12$

**b.** $0.8 \cdot 12$

**c.** $(1 + 0.2) \cdot 12$

**d.** $8 - 0.20$

**Problems 3–4:** Fill in the blanks to describe each increase or decrease as a percentage of the original amount.

**3.** This month, there was 30% more rain than last month.

The amount of rain this month is ..... % of the amount last month.

**4.** This month, there were 15% fewer cloudy days than last month.

The number of cloudy days this month is ..... of the number of cloudy days last month.

**5.** Elena is trying to decide which of two dresses to buy. The first dress has a retail price of $\$65$ with a $20\%$ markdown. The second dress has a retail price of $\$75$ with a $25\%$ markdown.

**a** Which dress costs less with its markdown? Show or explain your thinking.

**b** Which dress has a larger markdown value, or *discount*? Show or explain your thinking.

**6.** Noah wants to buy a pair of sneakers that has a retail price of $\$160$ and checks the websites of two stores to see if they have them. At the first store, the sneakers are marked down by $25\%$. At the second store, the sneakers are marked down by $15\%$. Noah can also get an additional $10\%$ markdown for being a student if he shows his school I.D. at the second store. He thinks the sneakers will cost the same price at both stores because $25\% = 15\% + 10\%$. Do you agree? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 4.03

**1.** There are 17% more girls in the eighth grade than in the seventh grade. If $s$ is the number of girls in the seventh grade and $e$ is the number of girls in the eighth grade, which equations represent the relationship between the number of girls in the seventh and eighth grade? Select *all* that apply.

- ☐ **A.** $e = 17 + s$
- ☐ **B.** $e = 1.17s$
- ☐ **C.** $e = (1 + 0.17)s$
- ☐ **D.** $e = s + 0.17s$
- ☐ **E.** $e = 17 + 0.17$

**2.** The retail price of a dress is marked down by 30%. If $r$ is the retail price of the dress and $s$ is the sale price after the markdown, which of the following equations do *not* represent the relationship between $r$ and $s$?

- **A.** $s = (1-0.30)r$
- **B.** $s = 1.30r$
- **C.** $s = 0.7r$
- **D.** $s = r - 0.30r$

**2.** Match each situation to the equation(s) that can be used to determine the unknown value.

**a.** The population of geese in a northern city decreases by 68% from last season. If there are now 2,200 geese, how many geese were there last season?

**b.** The population of a certain type of beetle is now 2,200 after a 68% increase. What was the original population?

**c.** There are 2,200 fish in a pond. This is after a 32% decrease in the fish population. What was the original population of fish in the pond?

- ..... $2200 = 1.68x$
- ..... $2200 = 0.68x$
- ..... $2200 = (1 - 0.68)x$
- ..... $2200 = 0.32x$
- ..... $2200 = x - 0.32x$
- ..... $2200 = (1 + 0.68)x$
- ..... $2200 = (1 - 0.32)x$
- ..... $2200 = x + 0.68x$
- ..... $2200 = x - 0.68x$

**3.** Write and solve an equation for each problem.

**a** Han's older brother works at the local department store. If Han shops there while his brother is working, he can get an $18\%$ family discount on anything he buys. How much will a $\$77$ hoodie cost if Han uses his family discount?

**b** A townhouse that was built several years ago has a current market value of $\$130{,}000$. If this represents an $18\%$ increase in its market value since it was built, how much was it originally worth?

**4.** A summer camp has $200$ children enrolled this year.

**a** If there were $125$ children enrolled last year, what was the percent increase in enrollment from last year to this year?

**b** The camp director uses the percent increase from last year to predict the number of children that will enroll next year. Write and solve an equation to represent the number of children enrolled in the summer camp next year, $y$, given the number of children that were enrolled this year, $x$.

**5.** Kiran's grandfather gave him a vintage comic book that is now worth $\$3{,}000$. This represents a $1{,}250\%$ increase in its value from the time his grandfather bought the comic book when he was a child. Kiran writes the equation $y = 12.50x$ to determine the price his grandfather paid for the comic book, using $y$ to represent the new value and $x$ to represent the original value. Is his equation correct? Explain your thinking.

**6.** Explain why a percent increase can be greater than $100\%$ but a percent decrease cannot be.

Name: ..... Date: ..... Period: .....

# Additional Practice 4.04

**1.** The number of tomatoes in a garden decreased by $25\%$ between last season and this season. This season, there are $63$ tomatoes in the garden. What was the tomato population last season? Use a diagram, if needed, to help you make sense of the situation.

**2.** Chloe noticed that a bag of lemons at the grocery store increased from $\$2.00$ to $\$3.00$ a bag. Chloe told the cashier that this represents a $150\%$ increase. Without determining the actual percent increase, explain why Chloe's observation is not reasonable.

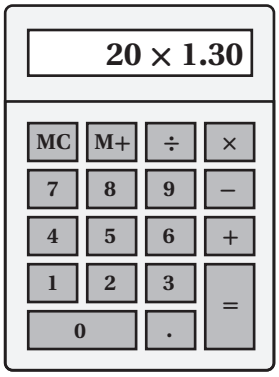
**3.** A movie theater sells $8\%$ more tickets this week than last week. If they sell $270$ tickets this week, how many tickets did they sell last week? Use a diagram, if needed, to help you make sense of the situation.

**4.** The label on a carton of soup says that it has "$20\%$ less sodium than the original recipe." If the soup has $2{,}000$ mg of sodium in it, how much sodium is in the original recipe? Use a diagram, if needed, to help you make sense of the situation.

Name: ..... Date: ..... Period: .....

**5.** Kiran purchases two game systems so he can keep one and resell the other one when they sell out in stores. He finds a buyer who is willing to purchase one game system for $\$900$, which represents an $125\%$ increase in the retail price of the game system. What was the price of the game system in the store? Use a diagram, if needed, to help you make sense of the situation.

**6.** An employee at a clothing store is asked to add a $130\%$ markup on all $\$20$ shirts by their supervisor. The employee enters the expression shown into their calculator and then changes the prices of all the $\$20$ shirts to $\$26$.




**a** What mistake did the employee make? Explain your thinking.

**b** How much more should the shirts cost after a $130\%$ markup?

**7.** Next month, the price of a carton of strawberries at a grocery store will decrease by $30\%$. The price of a carton of strawberries this week is $\$6.50$. What will the price be next month?

**A.** $\$8.45$

**B.** $\$6.75$

**C.** $\$4.55$

**D.** $\$3.45$

Name: ..... Date: ..... Period: .....

# Additional Practice 4.05

**1.** Determine the percent change. Use a tape diagram, if needed, to solve each problem. Show or explain your work. Round to the nearest tenth, if necessary.

**a** Original Price: $135
Markup Price: $162

**b** Original Price: $162
Markdown Price: $135

**2.** Jada plans to buy a pair of jeans on sale for $45 with money from her next paycheck. When the sale is over, the jeans will return to their original retail price of $75.

**a** What is the percent change from the retail price to the sale price?

**b** What is the percent change from the sale price back to the retail price?

**c** Explain why the percent change in part a is *not* equal to the percent change in part b.

**3.** A brand new car has a price tag of $12,500.

**a** If the same car is worth $9,875 one year later, what is the percent change in the car's value from the previous year?

**b** If the same car is worth $8,295 one year after that, what is the percent change in the car's value from the previous year?

**4.** Han drinks $1$ pt of water a day. He makes it a goal to increase his water intake.

**a** By what percentage does Han's water intake increase if he switches from a pint-sized water bottle to a quart-sized water bottle? **Hint:** $1 \text{ qt} = 2 \text{ pt}$.

**b** By what percentage does Han's water intake increase if he switches from a quart-sized water bottle to a gallon-sized water bottle? **Hint:** $1 \text{ gallon} = 4 \text{ qt}$.

**5.** Last month, the price of windshield wiper fluid at a particular windshield wiper fluid station was $\$1.29$ per gallon. This month, it is $\$2.70$ per gallon. Without determining the actual percent increase, explain how you know the percent change in the price of windshield wiper fluid from last month to this month is greater than $100\%$.

**6.** The population of a new middle school in its first year is $120$ students.

**a** If the population of the school in its second year is $252$ students, what is the percent change in the student population from the first year?

**b** If the population of the school in its third year is $363$ students, what is the percent change in the student population from the second year?

Name: ..... Date: ..... Period: .....

# Additional Practice 4.07

**1.** Han is charged $\$11.70$ sales tax on an item that costs $\$195.00$. Which of the following represents the tax rate in Han's state?

**A.** $0.06\%$

**B.** $6\%$

**C.** $16.7\%$

**D.** $167\%$

**2.** Clare buys an outfit when visiting a mall in Atlanta, GA, where the combined sales tax rate as of $2024$ is $8.9\%$. Complete the table to show the sales tax and the total price including tax for each item that Clare purchased at the mall.

| Item | Price before tax ($) | Sales tax ($) | Total cost ($) |
|---|---|---|---|
| Blouse | 30 | | |
| Jeans | 65 | | |
| Jacket | 88 | | |

**3.** Jada orders a takeout dinner for $\$18$ using a food delivery app. She has the option to tip the delivery driver $15\%$, $18\%$, or $20\%$.

**a** Complete the table.

| Percent of tip (%) | 15 | 18 | 20 |
|---|---|---|---|
| Tip amount ($) | | | |

**b** If the sales tax rate is $8.5\%$, how much sales tax does Jada pay?

**c** If Jada chooses to tip $20\%$ on the cost before sales tax, what is the total cost of Jada's food delivery, including tax and tip?

**4.** Lin gets a pedicure for $\$24$ at her local nail salon.

**a** If a sales tax of $\$2.10$ is added to her bill, what is the sales tax rate in the city where the nail salon is located? Show your thinking.

**b** If Lin can only afford to tip her nail technician $12\%$ of the cost of her pedicure before sales tax, how much does Lin pay in total at the nail salon, including the tax and tip? Show your thinking.

**5.** Kiran and Priya eat at a restaurant together. Kiran orders an entree that costs $\$38$. Priya orders an appetizer for $\$24$ and a dessert for $\$14$.

**a** Kiran says the cost of their meals, including tax, will be exactly the same. Do you agree with Kiran? Explain your thinking.

**b** Kiran and Priya are given a single receipt with both their orders on it. What is the tip amount if 18% gratuity is automatically added to their bill? Show your thinking.

**c** If the sales tax rate is $6.5\%$ and Kiran and Priya decide to split the cost of the meal evenly, including tax and tip, how much does each person pay? Show or explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 4.08

**Problems 1–2:** A customer leaves a 20% tip on a $25 meal.

**1.** Select the expression that represents the value of the tip.

- ☐ **A.** $20 \cdot 25$
- ☐ **B.** $25 + 2 \cdot 25$
- ☐ **C.** $1.20 \cdot 25$
- ☐ **D.** $\frac{20}{100} \cdot 25$

**2.** Select the expression that represents the total bill.

- ☐ **A.** $20 \cdot 25$
- ☐ **B.** $25 + 2 \cdot 25$
- ☐ **C.** $1.20 \cdot 25$
- ☐ **D.** $\frac{20}{100} \cdot 25$

**Problems 3 – 4:** Luciana works at a cafe. In an average 8-hour work day, she serves 15 customers, with an average bill of $25 per customer. She typically receives a 15% tip on each bill and earns $10.50 per hour.

**3.** How much money does Luciana earn on a typical day?

**4.** Let's say the typical tip increased to 20% of the bill. By what amount did Luciana's earnings increase by? Explain your thinking.

Name: Date: Period:

**Problems 5–7:** Here is some information about three local parks in a town. Complete each sentence.

| Park | Area (acres) |
|---|---|
| Sunset Cove | 12 |
| Cozy Corner | 22 |
| Morning Stroll | 30 |

**5.** Cozy Corner is about _____ % larger than Sunset Cove.

**6.** Morning Stroll is about _____ % larger than Cozy Corner.

**7.** If the size of Sunset Cove increased by $150\%$, would it be larger than Morning Stroll? Explain your thinking.

**Problems 8–9:** Jose is expanding the size of his house. He wants to add $10\%$ to the square footage of his home. His home is currently $1{,}500$ square feet.

**8.** Select the expression that represents the value of the tip.

- ☐ **A.** $\frac{10}{100} \cdot 1{,}500$
- ☐ **B.** $10 + 1.1 \cdot 1{,}500$
- ☐ **C.** $1.10 \cdot 1{,}500$
- ☐ **D.** $10 \cdot 1500$

**9.** Select the expression that represents the total square footage of Jose's home after the expansion is complete.

- ☐ **A.** $\frac{10}{100} \cdot 1{,}500$
- ☐ **B.** $10 + 1.1 \cdot 1{,}500$
- ☐ **C.** $1.10 \cdot 1{,}500$
- ☐ **D.** $10 \cdot 1500$

Name: ..... Date: ..... Period: .....

# Additional Practice 4.09

**1.** Noah goes to the deli to order $2$ lb of turkey breast. When he receives his order, the weight is $1.95$ lb. Which expression represents the percent error?

**A.** $\frac{0.5}{1.95} \cdot 100$

**B.** $\frac{0.05}{1.95} \cdot 100$

**C.** $\frac{0.5}{2} \cdot 100$

**D.** $\frac{0.05}{2} \cdot 100$

**2.** A particular game at a carnival invites players to guess the number of marbles in a jar. One player makes a guess of $225$ marbles. The actual number of marbles is $299$. What is the percent error, to the nearest tenth of a percent?

**3.** According to the U.S. Bureau of Engraving and Printing, the actual weight of an average dollar bill is $1$ g. When Diego weighs a single dollar bill on his scale, he gets a weight of $1.03$ g. Determine the percent error of this measurement.

**4.** The thermostat in Andre's house gives a reading with an error of $4\%$ below the actual temperature. If the actual temperature in Andre's house is $71°$F, what is the reading on the thermostat, to the nearest tenth of a degree?

**5.** The water in the deep side of a pool has a depth of $80$ in.

**a** Mai gets in the pool and accurately estimates its depth to the nearest foot. What measurement did Mai get?

**b** By how many inches does Mai's measured depth differ from the actual depth of the pool?

**c** Determine the percent error of this measurement.

**6.** Jada sends invitations to $80$ people for a barbecue she plans to have at the end of the school year. $68$ people accept the invitation. On the day of the barbecue, $63$ people attend.

**a** Which value is the exact, or correct, value for the number of attendees to the barbecue? Which is the expected value? Explain your thinking.

**b** Determine the percent error of this measurement.

**7.** Han estimates his puppy weighs $40$ lb. During a visit to the vet, Han learns that his puppy actually weighs $44.6$ lb.

**a** What is the error, expressed as a percent of the puppy's actual weight?

**b** What is another value for the puppy's weight that would result in the same percent error? Show or explain your thinking.

**c** Is it possible to have $3$ values that have the same percent error? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 4.10

**1.** A notebook costs $8 before tax. A customer has a coupon for a 10% discount. Then a 5% sales tax is added. How much will the customer pay for the notebook?

**Problems 2–3:** Dalia needs to buy chili peppers for a recipe. At the grocery store, she finds red chili peppers that are available per ounce. The grocery store charges $14 per ounce.

**2.** At the farmers market in the next town, Dalia remembers that the red chili peppers cost $10 per ounce. By what percent did the price increase at the grocery store?

**A.** 10%

**B.** 25%

**C.** 40%

**D.** 60%

**3.** Dalia needs the chili peppers quickly for an upcoming dinner party, so she buys them at the grocery store. While checking out at the grocery store, she finds a coupon for a 25% discount. Then a 6% sales tax is added. How much will Dalia pay for the chili peppers if she buys 1 ounce, 3 ounces, and 4 ounces? Fill the missing values in the table.

| Red chili peppers (in ounces) | Cost (in $) | Amount of coupon discount (in $) | Amount of sales tax (in $) | Amount Dalia will pay |
|---|---|---|---|---|
| 1 | 14 | 3.50 | 0.63 | |
| 3 | 42 | | 1.89 | |
| 4 | | 14 | | |

**Problems 4–6:** A clothing store allows customers to use multiple coupons when checking out. You want to buy a jacket that costs $57. Suppose you have a $7 off coupon and a 15% off coupon. The cashier will calculate the new price of the jacket after each coupon is used.

**4.** You use the $7 off coupon first and then the 15% off coupon. What is the total price of the jacket after you hand the cashier the coupons in this order?

**5.** Your friend, Jackie, buys the same jacket. However, Jackie hands the cashier the 15% off coupon first. Then, she hands the cashier the $7 off coupon. How much does Jackie pay for the jacket?

**6.** Does the order you use the coupons make a difference? Explain your thinking.

**Problems 7–9:** An art shop in town has a 5% sales tax.

**7.** A pack of pencils costs $6.80 before tax. How much does it cost including tax?

**8.** A paintbrush set costs $31.50 after tax. How much did it cost before tax?

**9.** A sketchbook costs $18.00 after tax. How much did it cost before tax?

Name: ..... Date: ..... Period: .....

# Additional Practice 4.11

**1.** Juniper is painting her kitchen. She wants to paint her kitchen with a shade of paint called Sunset Yellow. To make this shade of paint, Juniper needs to mix 6 quarts of yellow paint with $\frac{1}{3}$ of a cup of orange paint. How much yellow paint should be mixed with 2 cups of orange paint to make Sunset Yellow?

**Problems 2–3:** A local organic spice store offers:

| | | |
|---|---|---|
| $3\frac{1}{2}$ ounces of basil for \$21.00 | $\frac{5}{8}$ ounces of rosemary for \$3.50 | $1\frac{1}{2}$ ounces of oregano for \$9.90 |

**2.** Which spice is the least expensive per ounce? Show or explain your thinking.

**3.** Which spice is the most expensive per ounce?

**Problems 4–5:** Emilia wants to buy stickers at a stationary store. The stickers are sold by the sheet.

**4.** Emilia has \$60 to spend on stickers. How many sheets of stickers can she buy? Fill the missing value into the table.

| Number of Sheets | Total Cost (\$) |
|---|---|
| 2 | 6 |
| | 60 |

**5.** What equation represents the relationship between the total cost, $c$, and the number of sticker sheets, $s$?

**A.** $s = \frac{1}{3}c$

**B.** $s = 3c$

**C.** $c = \frac{1}{3}s$

**D.** $c = 2s$

Name: Date: Period:

**Problems 6–8:** A tortoise is moving away from the beach at a constant rate. This table shows the distance the tortoise is from the beach at certain times.

| Distance (ft) | Time (min) |
|---|---|
| $0$ | $0$ |
| $1$ | $1\frac{2}{3}$ |

**6.** How many minutes does it take for the tortoise to reach a distance of $5$ feet from the beach?

**7.** How far will the tortoise be from the beach after $8$ minutes?

**8.** Select *all* the equations that represent the relationship between the distance in feet, $d$, and time in minutes, $t$.

- ☐ **A.** $t = \frac{5}{3}d$
- ☐ **B.** $t = \frac{3}{5}d$
- ☐ **C.** $d = \frac{5}{3}t$
- ☐ **D.** $d = \frac{3}{5}t$

Name: ..... Date: ..... Period: .....

# Additional Practice 4.12

**1.** Select *all* the ratios that are equivalent to $3 : 4$.

- ☐ **A.** $6 : 8$
- ☐ **B.** $1.5 : 2$
- ☐ **C.** $4 : 5$
- ☐ **D.** $9 : 12$
- ☐ **E.** $15 : 16$

**2.** On a map, the library is $1.5$ inches from Cordelia's house. The map has a scale of $1$ inch to $10$ miles. How far apart, in inches, would Cordelia's house be from the library on a map that has a scale of $1$ inch to $60$ miles?

**3.** What is $30\%$ of $180$?

**4.** What is $180\%$ of $60$?

**5.** Complete the table based on $y = \frac{1}{3}x$

| $x$ | $y$ |
|---|---|
| $12$ | |
| | $6\frac{1}{3}$ |
| $24$ | |

**Problems 6–7:** To make a specific color of purple paint, a painter mixes $\frac{1}{3}$ of a gallon of red paint with $\frac{3}{5}$ of a gallon of blue paint.

**6.** How many gallons of red paint are needed to mix with $3$ gallons of blue paint?

**7.** How many gallons of blue paint are needed to mix with $10$ gallons of red paint?

**A.** $12$

**B.** $14$

**C.** $16$

**D.** $18$

**8.** A brownie recipe calls for $\frac{1}{4}$ teaspoon of baking powder and $1$ cup of flour. Complete the table to show how much baking powder and flour is needed for different batches of the brownie recipe.

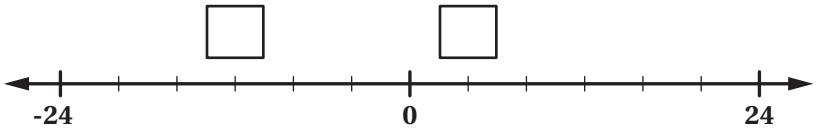
| Baking powder (teaspoon) | Flour (cups) |
|---|---|
| $\frac{1}{4}$ | $1$ |
| $\frac{3}{4}$ | $3$ |
| $1\frac{1}{2}$ | $6$ |
| | $8$ |
| | $10\frac{1}{2}$ |

Name: ..... Date: ..... Period: .....

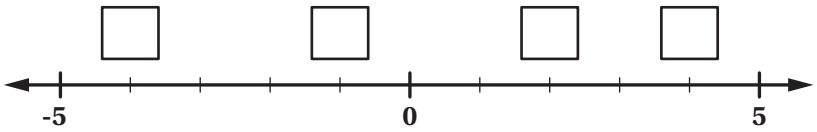
# Additional Practice 7.01

**Problems 1–4:** Fill in the blanks on the number lines.

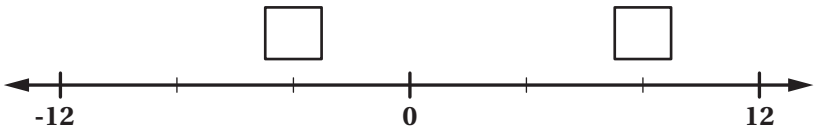
**1.**



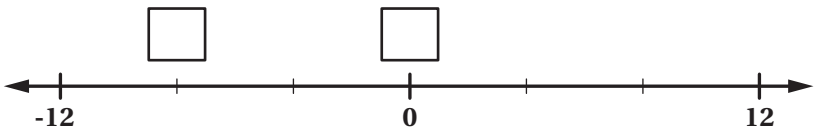

**2.**




**3.**

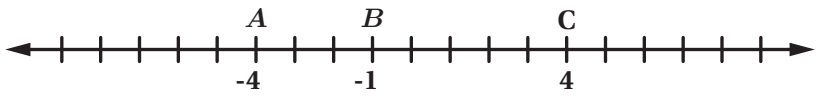



**4.**



Name: ..... Date: ..... Period: .....

**Problems 5–8:** Here is a number line.




**5.** Describe where you would plot $50$ on the number line.

**6.** Point $D$ is $3$ units to the left of point $A$. Plot point $D$.

**7.** Point $E$ is at $0$. Where is Point $E$ located?

**A.** To the left of Point A

**B.** Between Points A and B

**C.** Between Points B and C

**D.** To the right of Point C

**8.** What locations are $2$ units away from point $B$?

**A.** -3 and 1

**B.** -4 and 2

**C.** -5 and -2

**D.** -6 and -5

Name: ..... Date: ..... Period: .....

# Additional Practice 7.02

**1.** For each number, name its opposite.

**a** $0$

**b** $11$

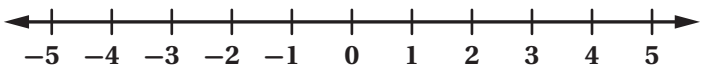
**c** $-1\frac{1}{3}$

**d** $-3.125$

**e** $9.15$

**f** $\frac{3}{4}$

**2.** Plot and label each point on the number line.




**a** Point $A$ is located at the opposite of $0$.

**b** Point $B$ is located at the opposite of $2.5$.

**c** Point $C$ is located at the opposite of $-4$.

**d** Point $D$ is located at $-1$.

**e** Point $E$ is located at $3.5$.

**f** Point $F$ is located at $-\frac{5}{3}$.

**3.** Where would the temperature $-3.2°\text{F}$ be located on a thermometer? Select *all* that apply.

☐ **A.** Between $0$ and $-5$

☐ **B.** Between $2$ and $4$

☐ **C.** Between $-3$ and $-4$

☐ **D.** Between $3$ and $-3$

☐ **E.** Between $-10$ and $0$

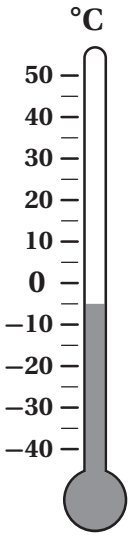
☐ **F.** Between $-3$ and $-3.5$

Name: ..... Date: ..... Period: .....

**4.** Where would the number $-\frac{17}{2}$ be located on a number line? Select *all* that apply.

- ☐ **A.** Between $-16$ and $-18$
- ☐ **B.** Between $-7$ and $-10$
- ☐ **C.** Between $-\frac{19}{2}$ and $-\frac{15}{2}$
- ☐ **D.** Between $-6$ and $-8$
- ☐ **E.** Between $-15$ and $-17$
- ☐ **F.** Between $-\frac{33}{4}$ and $-\frac{35}{4}$

**5.** Refer to the thermometer showing degrees Celsius.




**a** What is the temperature shown?

**b** What is the opposite of the temperature shown?

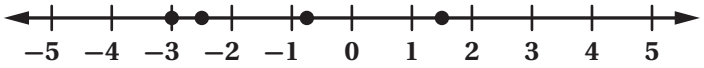
**c** What would the temperature be if it was $5°$ warmer?

**d** What would the temperature be if it was $10°$ colder?

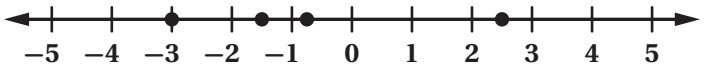
**e** What would the temperature be if it was $2.5°$ warmer?

**6.** Bard and Andre each plotted the numbers $-\frac{3}{4}$, $1\frac{1}{2}$, $-3$, and $2.5$ on the number lines shown. Who is correct? Explain your thinking.

Bard



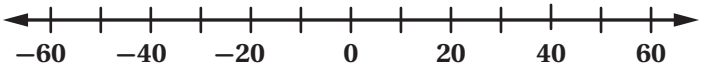

Andre




**7.** The temperatures in Miami, FL, and Anchorage, AK, are rarely the same.

**a** One evening, the temperature in Miami was $28°\text{C}$. During that same evening in Anchorage, it was $32°\text{C}$ cooler than it was in Miami. What was the temperature in Anchorage?

**b** For both cities, plot the temperature and their opposite temperature.




**c** Clare says the temperature for Miami is closer to $0$ than the temperature for Anchorage. Do you agree? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 7.04

**1.** Here are five numbers: $-\frac{3}{4}, -2, 1, \frac{3}{2}, 2$

Suppose these numbers are plotted on a horizontal number line. Which statement about the locations of the numbers is true?

**A.** 2 is the farthest to the right, and $-\frac{3}{4}$ is farthest to the left.

**B.** 2 is the farthest to the right, and $-2$ is farthest to the left.

**C.** 1 is the farthest to the right, and $-\frac{3}{4}$ is farthest to the left.

**D.** $-\frac{3}{4}$ is the farthest to the right, and 2 is farthest to the left.

**Problems 2–4:** Circle whether each statement is *true* or *false*.

**2.** $-2.7$ is to the left of $-1.9$ on the number line. True False

**3.** $-3.2$ is greater than $-2.1$. True False

**4.** Choose one statement from the previous two problems and explain your thinking.

**5.** Use the symbols $>$, $<$, or $=$ to compare each pair of numbers.

**a** $\frac{3}{4} \square \frac{7}{8}$

**b** $\frac{1}{4} \square \frac{2}{8}$

**c** $\frac{6}{10} \square 0.5$

**d** $0.5 \square \frac{50}{100}$

**e** $\frac{9}{11} \square \frac{9}{10}$

**f** $\frac{1}{2} \square \frac{1}{4}$

Name: ..... Date: ..... Period: .....

**6.** Use the symbols $>$, $<$, or $=$ to compare each pair of numbers.

**a** $9.12 \square 9.21$

**b** $6.4 \square 6.04$

**c** $17.9 \square 17.90$

**d** $12.25 \square 12.52$

**e** $4.0 \square 4.00$

**f** $5.8 \square 58$

**7.** Which expressions are solutions to the equation $\frac{5}{6}x = 10$? Select *all* that apply.

☐ **A.** $10 \div \frac{5}{6}$

☐ **B.** $10 \div \frac{6}{5}$

☐ **C.** $\frac{10}{\frac{5}{6}}$

☐ **D.** $\frac{5}{6} \div 10$

☐ **E.** $10 \cdot \frac{5}{6}$

☐ **F.** $\frac{6}{5} \cdot 10$

**8.** Diego is selling raffle tickets for $\$1.50$ per ticket. Complete the table to show how much money he would earn if he sold each number of tickets.

| Number of tickets sold | 20 | 50 | $r$ |
|---|---|---|---|
| Amount earned ($) | | | |

**9.** Movie tickets at a local theater sell for $\$8.25$.

**a** Complete the table to show how much the theater will earn for selling each number of movie tickets.

| Number of tickets sold | 4 | 22 | $t$ |
|---|---|---|---|
| Amount earned ($) | | | |

**b** Mai says that in order for the theater to earn $\$561$, the theater must sell $60$ tickets. Is Mai correct? Explain your reasoning.

Name: ..... Date: ..... Period: .....

# Additional Practice 7.03

**1.** Write an integer that represents each elevation.

**a** The Dead Sea has an elevation of $430$ m below sea level.

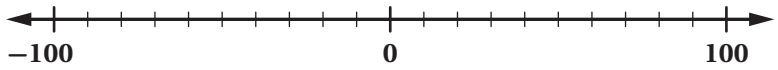
**b** Santa Fe, New Mexico, has an elevation of $2{,}194$ m above sea level.

**c** Indio, California, has an elevation of $6$ m below sea level.

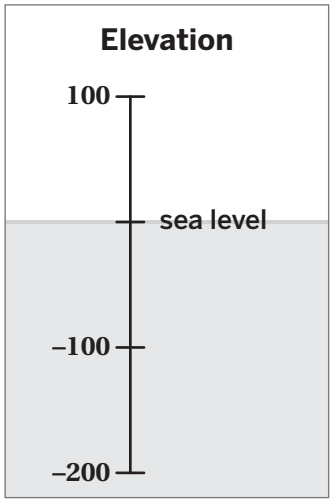
**d** Lake Eyre, Australia, has an elevation of $16$ m below sea level.

**e** Flagstaff, Arizona, has an elevation of $2{,}106$ m above sea level.

**2.** Baku, Azerbaijan, has an elevation of $92$ ft below sea level. Suva, Fiji, has an elevation at sea level. Havana, Cuba, has an elevation of $13$ ft above sea level. Plot and label each location as a point on the number line.




**3.** The statements in parts a–d describe the movements of a humpback whale in the ocean. Each statement starts from the whale's elevation in the previous statement.




**a** A humpback whale is at the surface of the ocean to breathe. What is the whale's elevation?

**b** The whale then dives down $180$ ft to feed. What is the whale's elevation now?

**c** The whale breaches (leaps) $10$ ft into the air. What is the whale's elevation now?

**d** Plot and label the three elevations as points on the vertical number line.

**4.** Complete these problems about sea level and elevation.

**a** Which elevation is closer to sea level: $-12$ m or $15$ m?

**b** Which elevation is closer to sea level: $10$ m or $-20$ m?

**c** A sea gull dives $12$ ft below sea level. Then it swims $9$ ft toward the surface. What is its elevation?

**d** Another sea gull dives $9$ ft below sea level. Then it swims down another $16$ ft. What is its elevation?

**5.** Complete the table for each elevation with the correct sign and its relation to sea level.

| Elevation | Corresponding sign (+/−/no sign) | Relation to sea level (above/below/at) |
|---|---|---|
| −26 m | | |
| 0 yd | | |
| 15 ft | | |

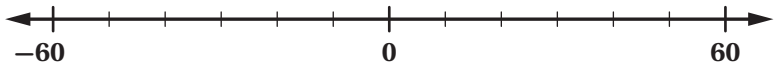
**6.** These statements describe the movements of a hiker on a trail. Each statement starts from the hiker's elevation in the previous statement.

**a** A hiker starts the trail at the base of the trail which is at sea level. What is the hiker's elevation?

**b** The hiker then walks up 24 m to a small summit. What is the hiker's elevation now?

**c** The hiker then walks down 28 m into Red Canyon. What is the hiker's elevation now?

**d** Plot and label the three elevations as points on the horizontal number line.



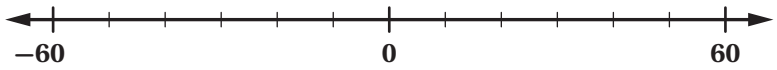

**7.** Using what you know about positive and negative numbers, complete these problems.

**a** The temperature was 12°C at nightfall and then dropped 8° by midnight. What was the temperature at midnight?

**b** The temperature was −8°C at dawn. By noon, the temperature rose 6°. What was the temperature at noon?

**c** The temperature was 24°C at nightfall and then dropped 30° by sunrise. What was the temperature at sunrise?

**d** Plot and label the three temperatures as points on the horizontal number line.

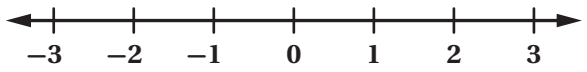



**8.** Clare claims that a city with an elevation of −15 ft is closer to sea level than a city with an elevation of 12 ft. Do you agree with her claim? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 7.05

**1.** Plot and label *all* the numbers that have an absolute value of $\frac{5}{2}$ on the number line.




**2.** Order these values from least to greatest.
$|3.4|$, $|-2|$, $0$, $2.6$, $-1$

**3.** The temperature at midnight was $4°\text{C}$ away from $0°\text{C}$. Select *all* the temperatures that could have been the temperature at midnight.

- ☐ **A.** $8°\text{C}$
- ☐ **B.** $4°\text{C}$
- ☐ **C.** $0°\text{C}$
- ☐ **D.** $-4°\text{C}$
- ☐ **E.** $-8°\text{C}$

**4.** The temperature at sunrise was $8°\text{C}$ away from $0°\text{C}$. List *all* the temperatures that could have been the temperature at sunrise.

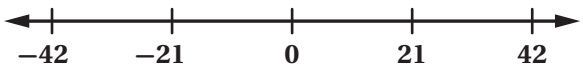
**5.** Coachella Valley, CA has an elevation of $21$ m below sea level.

**a** Using absolute value, represent the distance of Coachella Valley from sea level.

**b** Using an integer, represent the elevation of Coachella Valley.

**c** Using an integer, represent the opposite elevation of Coachella Valley.

**d** Plot the elevation of Coachella Valley and its absolute value on the number line.



Name: Date: Period:

**6.** Determine the absolute value of each number.

**a** $\left|-\frac{11}{12}\right|$

**b** $|-8|$

**c** $\left|1\frac{3}{4}\right|$

**d** $|3.9|$

**7.** Andre has three cats: Sparkles, Ember, and Ash. All three cats had the same weight at the beginning of the year. The table shows their change in weight by the end of the year.

| | Change in weight (lb) |
|---|---|
| Sparkles | $2\frac{1}{2}$ |
| Ember | $-\frac{1}{4}$ |
| Ash | $-2\frac{1}{4}$ |

**a** Order the cats from least to greatest absolute value of change in weight.

**b** Who had the greatest change in weight during the year? Explain your thinking.

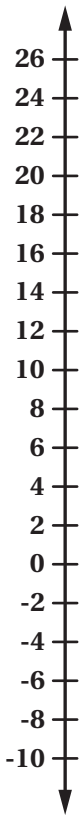
**8.** Shawn claims that the expressions $3.8$ and $|-3.8|$ do not have the same value because $|-3.8|$ includes a negative symbol and an absolute value symbol. Do you agree with Shawn? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 5.01

**Problems 1–5:** Melanie is studying different cities' elevations using a vertical number line. She wants to compare the heights of cities above and below sea level. Here are the elevations of four cities:

- Miami, FL: 3 feet above sea level
- New Orleans, LA: 6 feet below sea level
- Amsterdam, Netherlands: 7 feet below sea level
- Hamburg, Germany: 24 feet above sea level




**1.** Which city has the lowest height in relation to sea level?

**2.** The height of Venice, Italy is at sea level. Which of these 4 cities has the greatest difference between their height above sea level and Venice's?

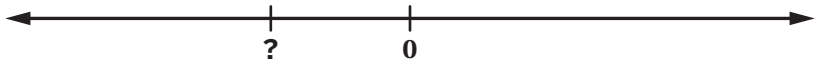
**3.** How much higher is Miami than New Orleans?

**4.** How much higher is Hamburg than Amsterdam?

**5.** How much higher is Hamburg than New Orleans?

**6.** Jericho is the lowest city on Earth, with a height of 250 meters below sea level and Jerusalem is 400 meters above sea level. What is the difference between their heights? Show your thinking.

**7.** Which of the following could be a possible value of the unknown number on the number line?




**A.** $\frac{1}{2}$

**B.** $3$

**C.** $-5$

**D.** $2.5$

**Problems 8–10:** The table shows the submarine's starting position and the action that will change its position. Each float will increase the submarine's position by $1$ unit. Each anchor will decrease the submarine's position by $1$ unit. Determine the submarine's final position for each scenario of actions.

| | Starting Position | Submarine Actions | Final Position |
|---|---|---|---|
| **8.** | $-4$ | Add 3 floats<br>Add 2 anchors | |
| **9.** | $1$ | Add 6 anchors<br>Add 1 float | |
| **10.** | $-2$ | Remove 1 float<br>Add 1 anchor | |

Name: ..... Date: ..... Period: .....

# Additional Practice 5.02

**Problems 1–4:** Determine the value of each expression.

**1.** $6 + -2$

**2.** $-6 + 2$

**3.** $-6 - 2$

**4.** $-6 - (-2)$

**5.** The temperature was $16$°F and then it dropped $12$ degrees. What was the temperature?

**6.** The temperature was $-16$°F and then it dropped $12$ degrees. What was the temperature?

**7.** The temperature was $-16$°F and then it rose to $12$ degrees. What was the change in temperature?

**8.** A swimmer was $6$ feet underwater. Then he swam $4$ feet deeper. Katrina wrote the expression $-6 - 4$. Rodney wrote the expression $-6 + (-4)$. Explain why both Katrina and Rodney are correct.

**Problems 9–10:** The table shows eight expressions.

**9.** Determine the value of each expression.

| | Expression | Value |
|---|---|---|
| Expression 1 | $2 + 4 - 6$ | |
| Expression 2 | $2 + 4 - 6 + 8$ | |
| Expression 3 | $2 + 4 - 6 + 8 - 10$ | |
| Expression 4 | $2 + 4 - 6 + 8 - 10 + 12$ | |
| Expression 5 | $2 + 4 - 6 + 8 - 10 + 12 - 14$ | |
| Expression 6 | $2 + 4 - 6 + 8 - 10 + 12 - 14 + 16$ | |
| Expression 7 | $2 + 4 - 6 + 8 - 10 + 12 - 14 + 16 - 18$ | |
| Expression 8 | $2 + 4 - 6 + 8 - 10 + 12 - 14 + 16 - 18 + 20$ | |

**10.** What is the value of the next expression? The $10$th expression? The $20$th expression? Show or explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 5.03

**Problems 1–3:** Determine the value of the variable that makes each equation true.

**1.** $12 + a = 5$

**2.** $-4.5 + b = 6.5$

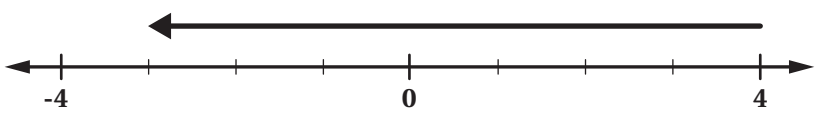
**3.** $c + 5.1 = 2.8$

**Problems 4–5:** Evaluate each expression.

**4.** $6 - 8$

**5.** $-6 - 8$

**6.** Select the equation that is represented by this number line.



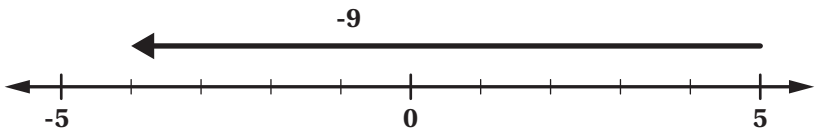

**A.** $x + (-3) = 4$

**B.** $4 + x = -3$

**C.** $-3 + x = 4$

**D.** $4 + (-3) = x$

**7.** Select the equation that is represented by this number line.




**A.** $x + (-9) = 5$

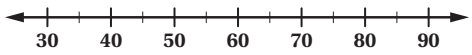
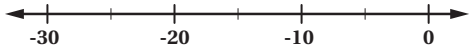
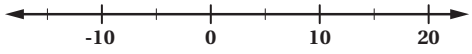
**B.** $-9 + x = 5$

**C.** $5 + x = -9$

**D.** $5 + (-9) = x$

Name: Date: Period:

**Problems 8–10:** Draw an arrow diagram to represent each situation. Then write an addition equation that represents the change in temperature and the final temperature.

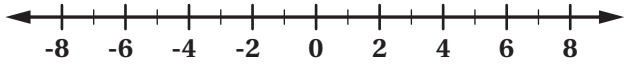
| | Situation | Arrow Diagram | Addition Equation |
|---|---|---|---|
| **8.** | The temperature was $60$°F and then fell $15$°F. |   | |
| **9.** | The temperature was $-20$°F and then rose $5$°F. |   | |
| **10.** | At sunrise, the temperature was $-10$°F. At noon, the temperature is $15$°F. By how much did the temperature rise? |   | |

Name: ..... Date: ..... Period: .....

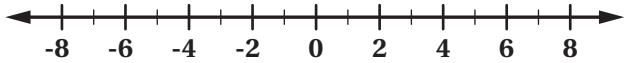
# Additional Practice 5.04

**Problems 1–3:** Use the number lines to determine the value of each expression.

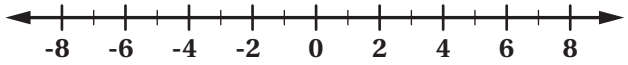
**1.** $2 - 6$




**2.** $(-1) + (-4)$




**3.** $-4 - (-8)$




**Problems 4–6:** Complete the tables and answer the follow-up question.

**4.**

| Expression | Value |
|---|---|
| $4 + (-5)$ | |
| $-5 + 3$ | |
| $-3 + (-10)$ | |
| $-1.5 + (-3.7)$ | |

**5.**

| Expression | Value |
|---|---|
| $-5 + 4$ | |
| $3 + (-5)$ | |
| $(-10) + (-3)$ | |
| $-3.7 + (-1.5)$ | |

**6.** Use your work from the previous tables to describe any patterns you notice.

Name: Date: Period:

**Problems 7–9:** Complete the tables and answer the follow-up question.

**7.**

| Expression | Value |
|---|---|
| $4 - 5$ | |
| $-5 - 3$ | |
| $-3 - (-10)$ | |
| $-1.5 - (-3.7)$ | |

**8.**

| Expression | Value |
|---|---|
| $5 - 4$ | |
| $3 - (-5)$ | |
| $(-10) - (-3)$ | |
| $-3.7 - (-1.5)$ | |

**9.** Use your work from the previous tables to describe any patterns you notice.

**10.** The expression $x + y$ equals $-3$. For what values of $x$, will $y$ be greater than $5$? Show or explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 5.05

**Problems 1–2:** Order the expressions from *least* to *greatest*.

**1.**

| $7 + (-5)$ | $-7 + 5$ | $7 + 5$ | $-7 + (-5)$ |
|---|---|---|---|
| | | | |

**Least** **Greatest**

**2.**

| $7 - (-5)$ | $-7 - 5$ | $7 - 5$ | $-7 - (-5)$ |
|---|---|---|---|
| | | | |

**Least** **Greatest**

**3.** Without calculating, select *all* the expressions below whose sum or difference will result in a negative value.

- ☐ **A.** $105 + (-74)$
- ☐ **B.** $-266 + (-87)$
- ☐ **C.** $141 - (-74)$
- ☐ **D.** $-130 - (-43)$
- ☐ **E.** $-100 - (-101)$
- ☐ **F.** $120 + (-121)$

**4.** Explain your thinking for Problem 3.

**5.** A bird flies above the sea but dives below the surface for food. If the bird is $15.2$ feet over the ocean's surface and the fish it catches is $3.5$ feet below the surface, which expression represents the total distance the bird dived?

**A.** $15.2 - 3.5$

**B.** $15.2 - (-3.5)$

**C.** $15.2 + (-3.5)$

**D.** $-3.5 + (-15.2)$

**Problems 6–9:** Determine the value of the variable that makes each equation true. Show your thinking.

**6.** $24 + w = -24.6$

**7.** $-12 - x = 10.6$

**8.** $y = \left(-\frac{1}{4}\right) + \frac{3}{8}$

**9.** $z + 8.9 = -16$

**10.** One of the coldest places on Earth is Denali, Alaska, where it can get as low as $-73.8$°C. One of the hottest locations on Earth is Death Valley, California, where it can get as high as $56.7$°C.

**a** Write two different expressions that would represent the difference between the temperatures in these two locations.

**b** Calculate the difference in temperatures between these two locations.

Name: ..... Date: ..... Period: .....

# Additional Practice 5.06

**Problems 1–3:** Determine the value of the variable that makes each equation true.

**1.** $6 \cdot a = -18$

**2.** $-6 \cdot (3) = b$

**3.** $-6 \cdot c = 18$

**Problems 4–6:** A weather station on top of a mountain reports that the temperature is currently $-10°\text{F}$ and has been decreasing at a constant rate of $2$ degrees per hour.

**4.** What will the temperature be in $5$ hours?

**5.** What was the temperature $2$ hours ago?

**6.** What was the temperature $4$ hours ago?

**Problems 7–9:** For each equation, check the box to show whether it is *true* or *false*. If the equation is false, change one value of the equation to make it true, and write the revised equation on the line.

| | | True | False | Revised Equation |
|---|---|---|---|---|
| **7.** | $(-4) \cdot (-5) = -20$ | | | |
| **8.** | $8 \cdot (-3) = 24$ | | | |
| **9.** | $(-6) \cdot (-1) = 6$ | | | |

Name: Date: Period:

**10.** Complete the table below for each action the submarine takes when starting at $0$ units. Provide a representation as a multiplication expression, determine the direction of the submarine, and its final value.

| Action | Representation | submarine's Direction | Final Value |
|---|---|---|---|
| Adding $2$ groups of $4$ floats | | | |
| Removing $3$ groups of $2$ floats | | | |
| Adding $4$ groups of $3$ anchors | | | |
| Removing $3$ groups of $1.5$ anchors | | | |

Name: ..... Date: ..... Period: .....

# Additional Practice 5.07

**1.** Match each addition expression to the equivalent multiplication expression.

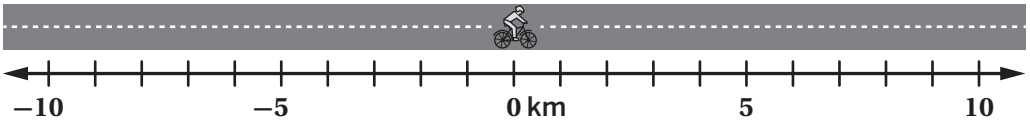
| | | |
|---|---|---|
| **a.** | $3 + 3 + 3 + 3$ | ..... $5 \cdot (-1)$ |
| **b.** | $-2 + (-2)$ | ..... $4 \cdot (-3)$ |
| **c.** | $-3 + (-3) + (-3) + (-3)$ | ..... $1 \cdot (-5)$ |
| **d.** | $-1 + (-1) + (-1) + (-1) + (-1)$ | ..... $4 \cdot 3$ |
| **e.** | $-5$ | ..... $2 \cdot (-2)$ |

**2.** Sort each multiplication expression according to whether its product is positive or negative.

| | | | | |
|---|---|---|---|---|
| $2 \cdot (-2)$ | $2 \cdot 2$ | $\frac{1}{2} \cdot \left(-\frac{1}{4}\right)$ | $3.5 \cdot 43$ | $0.001 \cdot \frac{1}{10}$ |

| Positive | Negative |
|---|---|
| | |

Use the diagram shown for problems 3 and 4.




**3.** The cyclist is moving at a steady speed and is currently at kilometer 0. Complete the table to determine the cyclist's position at various times.

| Time (minutes) | −6 | −4 | −2 | 0 | 2 | 4 |
|---|---|---|---|---|---|---|
| Position (km) | | | −4 | 0 | 4 | |

**4.** Write and evaluate an expression for the position of the cyclist at each time.

**a** 5 minutes

**b** −10 minutes

Name: Date: Period:

**5.** Determine the number that belongs in each box to make the equation true.

**a** $\square \cdot (-2) = -24$

**b** $\square \cdot (-8) = -24$

**c** $2 \cdot \square = -12$

**d** $4 \cdot \square = -24$

**6.** Complete the missing expressions and values in the table.

| Expression as a product | Expression as a sum | Value of the expressions |
|---|---|---|
| $2 \cdot (-3)$ | | |
| | $-\frac{1}{4} + \left(-\frac{1}{4}\right) + \left(-\frac{1}{4}\right) + \left(-\frac{1}{4}\right)$ | |
| $5 \cdot 0.4$ | | |
| | $\left(-2\frac{1}{3}\right) + \left(-2\frac{1}{3}\right) + \left(-2\frac{1}{3}\right)$ | |
| $6 \cdot (-0.1)$ | | |

**7.** Tyler and Bard are cycling on the boardwalk at the same time. When they pass the pier, Bard is cycling at a speed of $15$ ft/s and Tyler is cycling at a speed of $10$ ft/s.

**a** If $0$ represents the location of the pier, what values represent the location of each person In $5$ seconds? Show or explain your thinking.

**b** $8$ seconds before arriving at the pier, how many feet in front of Bard was Tyler? Show or explain your thinking.

**8.** Han says that $-(a \cdot b)$ will always be equal to $a \cdot (-b)$. Do you agree with Han? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 5.08

**1.** Select *all* the expressions that have a negative value.

- ☐ **A.** $-\frac{12}{10}$
- ☐ **B.** $\frac{-12}{10}$
- ☐ **C.** $\frac{12}{10}$
- ☐ **D.** $\frac{-12}{-10}$
- ☐ **E.** $\frac{12}{-10}$

**Problems 2–3:** Determine the value of $x$ that makes each equation true.

**2.** $-5x = -30$

**3.** $\frac{x}{-2.5} = 15$

**Problems 4–5:** Daniel pays for streaming services through an automatic monthly payment from his checking account. Over the course of the year (12 months), his account showed a total of $-\$83.88$ for the year's payments.

**4.** How much was the monthly payment for the streaming services? Make sure you show whether the charge was negative or positive. Show or explain your thinking.

**5.** What was the payment for 5 months of streaming services?

**6.** Select *all* the values that are equivalent to $-\frac{15}{8}$.

- ☐ **A.** $-\frac{17}{8}$
- ☐ **B.** $\frac{17}{8}$
- ☐ **C.** $-\frac{15}{8}$
- ☐ **D.** $-\frac{15}{-8}$
- ☐ **E.** $\frac{15}{-8}$

Name: ..... Date: ..... Period: .....

**7.** Order these expressions from *least* to *greatest*.

| $-12 \div (-4)$ | $-12 \div \left(-\frac{1}{4}\right)$ | $12 \div (-4)$ | $-12 \div \left(\frac{1}{4}\right)$ |
|---|---|---|---|
| | | | |

**Least** **Greatest**

**8.** Determine the missing value in each equation.

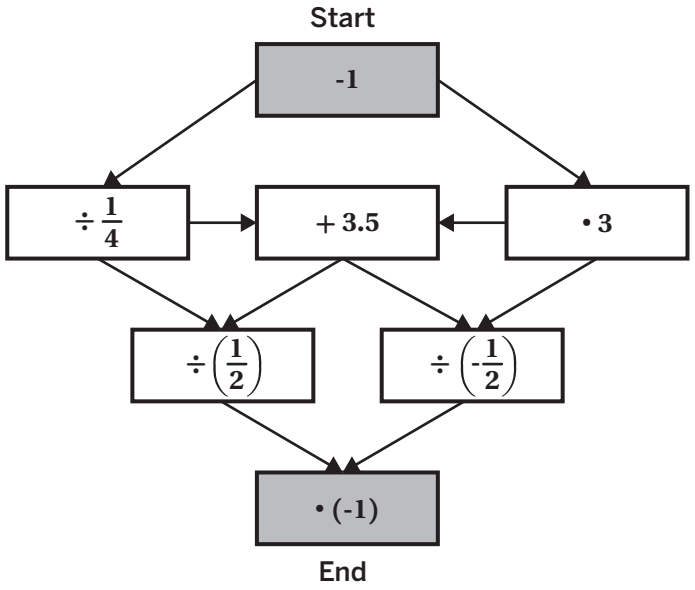
**a** $-45 \div$ ..... $= -9$

**b** $-21 \div$ ..... $= 3$

**c** ..... $\div 8 = -9$

**d** ..... $\div 2 = -\frac{1}{4}$

**9.** Move from box to box, starting from the value of $-1$, performing the indicated operation as you reach each new box. Choose a path that will give you the least possible value. You must follow the direction of the arrows. What is the *least* possible value you were able to determine?



Name: ..... Date: ..... Period: .....

# Additional Practice 5.10

**Problems 1–4:** Determine the value of the variable that makes each equation true.

**1.** $-12 + a = -16$

**2.** $-12 - 16 = b$

**3.** $-4c = -12$

**4.** $\frac{d}{-4} = 12$

**5.** Which expression has the *lesser* value? Explain your thinking.

**A.** $(-12) - (-4)$ **B.** $(-4) - (-12)$ **C.** They have the same value

**Problems 6–7:** Let $x = 3$, $y = -4$, and $z = -3$

**6.** Order these expressions from *least* to *greatest*.

| $x - z$ | $x - 2y$ | $x \cdot y$ | $xyz$ |
|---|---|---|---|
| | | | |

**Least** **Greatest**

**7.** Would your order be different if the value of $x$ was $-3$ instead? Explain your thinking.

**8.** For the expressions $\frac{a}{b}$ and $a + b$, choose values for $a$ and $b$ so that $\frac{a}{b}$ is negative and $a + b$ is positive.

**9.** For each set of values for $c$ and $d$, evaluate the given expressions and record your results in the table.

| $c$ | $d$ | $c + d$ | $c - d$ | $-c + d$ |
|---|---|---|---|---|
| $-\frac{2}{3}$ | $2\frac{5}{6}$ | | | |
| $\frac{2}{3}$ | $-2\frac{5}{6}$ | | | |

**10.** Describe any patterns you notice.

Name: ..... Date: ..... Period: .....

# Additional Practice 5.11

**Problems 1–4:** Determine the value of the variable that makes each equation true.

**1.** $4 \cdot (-3.4) = a$

**2.** $-10b = 40$

**3.** $-4 - \frac{2}{5} = c$

**4.** $\frac{d}{4} = -8.2$

**5.** A submarine starts at the surface and descends toward the ocean floor at a rate of $-25$ meters per minute for $30$ minutes. Select the expression that could represent the depth of the submarine after its descent.

**A.** $-25 \div 30$

**B.** $-25 \cdot 30$

**C.** $-25 + 30$

**D.** $-25 - 30$

**6.** For each equation, select an operation ($+$, $-$, $\cdot$, $\div$) to make the equation true.

**a** $-18$ ..... $2 = -9$

**b** $9$ ..... $\left(-\frac{2}{3}\right) = -6$

**c** $-9$ ..... $\left(-\frac{3}{4}\right) = 12$

**d** $11$ ..... $(-15) = -4$

**e** $-12$ ..... $(-15) = 3$

**f** $-12$ ..... $(-10) = 120$

Name: Date: Period:

**7.** Each table shows deposits and withdrawals for different bank accounts. Select the bank account that currently has the highest balance. Assume each account started with the same amount.

**A.**

| Andre |
|---|
| −30.50 |
| 19.50 |
| 42.40 |

**B.**

| Elena |
|---|
| 45.50 |
| −14.00 |
| 14.00 |

**C.**

| Clare |
|---|
| −23.70 |
| 95.70 |
| −60.40 |

**D.**

| Tyler |
|---|
| 25.50 |
| −70.30 |
| 50.40 |

**8.** Match each situation to an equation that could represent it.

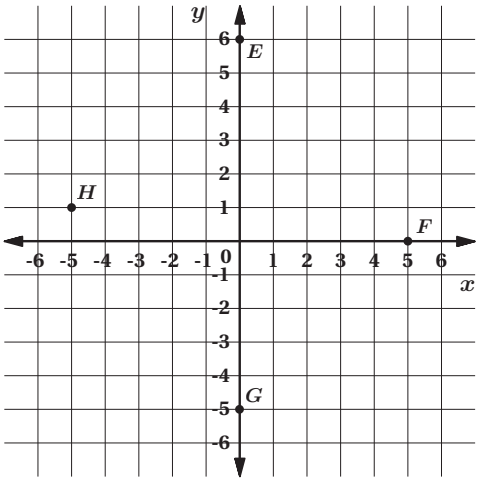
| | | |
|---|---|---|
| ____ | The temperature was decreasing at a rate of 1.5 m/s. How long will it take for the temperature to be 6° colder than it is now? | **a.** $1.5c = -6$ |
| ____ | A penguin descended below the surface of the ocean. After 1.5 seconds, the penguin was 6 feet below the surface. At what rate was the penguin diving? | **b.** $-6 + 1.5 = c$ |
| ____ | A seal was swimming at −6 m compared to sea level and then swam 1.5 m toward the surface. What is the seal's elevation now? | **c.** $-1.5c = -6$ |
| ____ | The temperature was −1.5°C and changed to −6°C. What was the change in temperature? | **d.** $-1.5 + c = -6$ |

Name: ..... Date: ..... Period: .....

# Additional Practice 7.10

**Refer to the coordinate plane for Problems 1 and 2.**

**1.** Plot and label the following four points:
$A(1, 1), B(-4, 1), C(-1, -1), D(1, -4)$.




**2.** Write the coordinates for each point.

**a** Point $E$

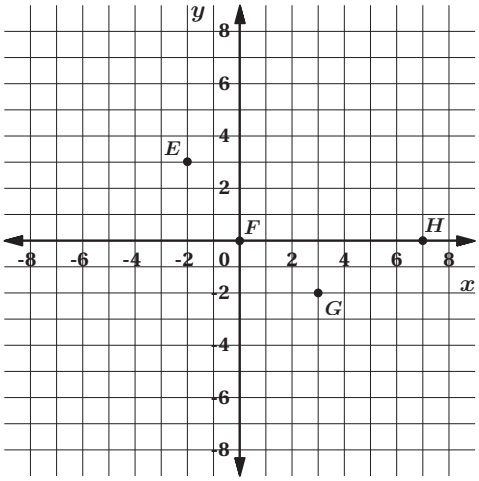
**b** Point $F$

**c** Point $G$

**d** Point $H$

**Refer to the coordinate plane for Problems 3 and 4.**

**3.** Plot and label the following four points:
$A(0, 7), B(-7, 0), C(-4, -3), D(4, 3)$.




**4.** Write the coordinates for each point.

**a** Point $E$

**b** Point $F$

**c** Point $G$

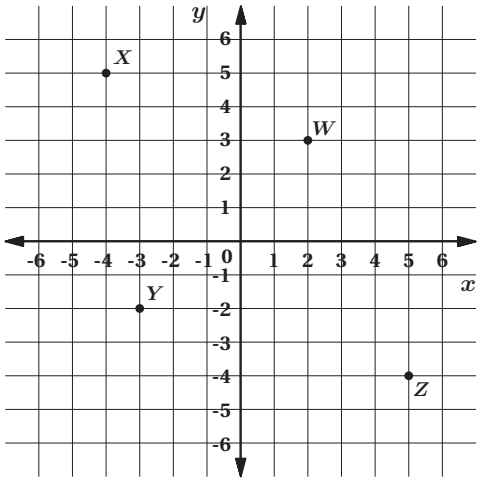
**d** Point $H$

**5.** When these three ordered pairs are plotted, the points fall on the same line: $(-3, -3)$, $(-3, 0)$, $(-3, 1)$.

**a** Is the line vertical or horizontal? Explain your thinking.

**b** Write the ordered pairs for two other points that also lie on this same line.

**6.** Refer to the coordinate plane.




**a** Complete the table to show the coordinates and quadrant for each point.

| Point | Coordinates | Quadrant |
|---|---|---|
| $W$ | | |
| $X$ | | |
| $Y$ | | |
| $Z$ | | |

**b** Point $V$ is located at $(0, 5)$. On what axis does point $V$ lie on?

**c** For all of the points in quadrant III, are both coordinates *positive* or *negative*?

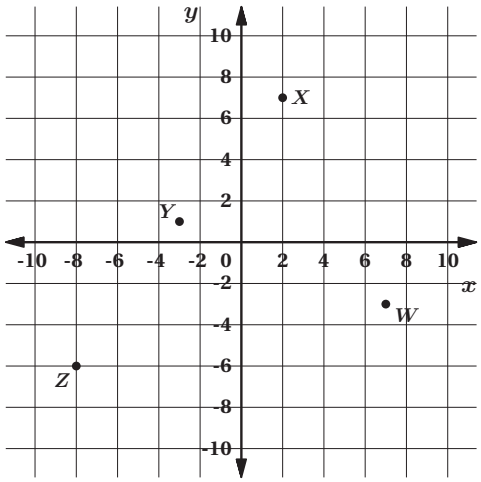
**7.** Priya says that if both coordinates of a point are positive, the point can be located in either quadrant I or quadrant II. Is Priya correct? Explain your thinking.

**8.** Priya says that if both coordinates of a point are negative, the point can be located in either quadrant III or quadrant IV. Is Priya correct? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 7.11

**1.** Refer to the coordinate plane.

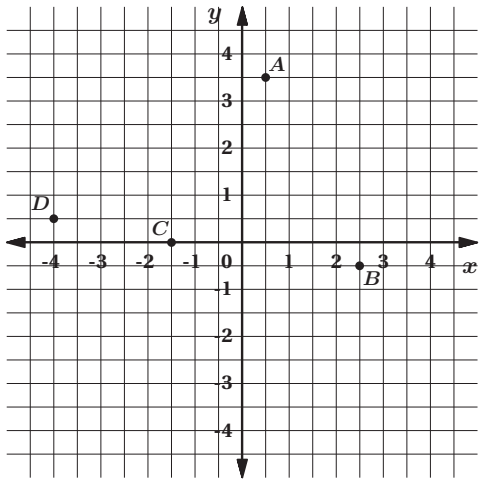



**a** What is the scale for this coordinate plane?

**b** Write the coordinates of each point.

| Point | Coordinates |
|---|---|
| $W$ | |
| $X$ | |
| $Y$ | |
| $Z$ | |

**2.** Refer to the coordinate plane.

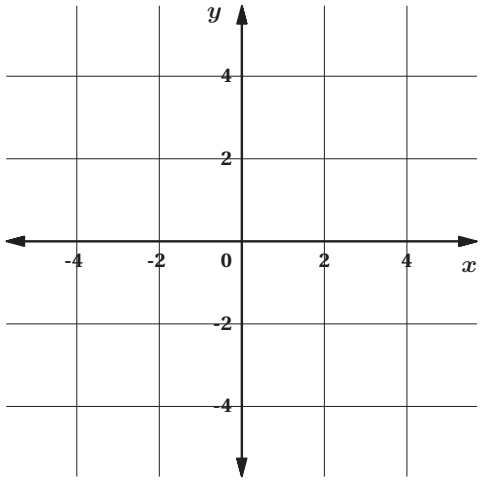



**a** What is the scale for this coordinate plane?

**b** Write the coordinates of each point.

| Point | Coordinates |
|---|---|
| $A$ | |
| $B$ | |
| $C$ | |
| $D$ | |

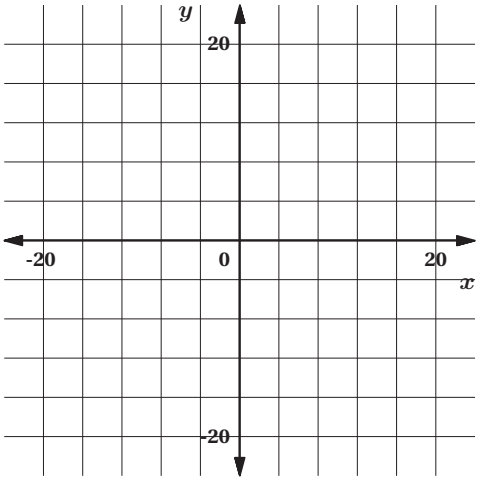
**3.** Refer to the coordinate plane.




**a** Name four points with integer coordinates that would form a square with the origin at its center.

**b** Plot these points on the coordinate plane to verify that they form a square.

**4.** Refer to the coordinate plane.

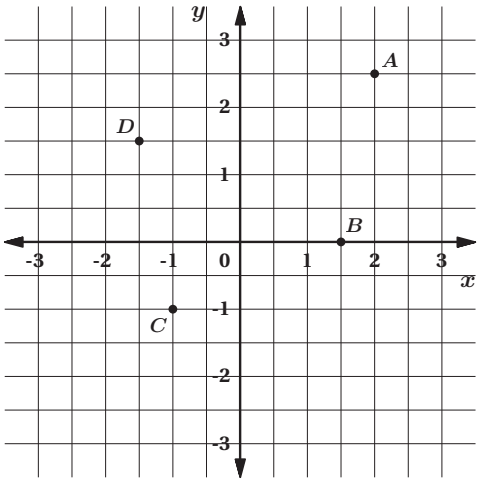



**a** What is the scale for this coordinate plane?

**b** Plot and label points $A(6, -4)$, $B(-12, 10)$ and $C(0, 2)$ on the coordinate plane.

**Refer to the coordinate plane for Problems 5 and 6.**

**5.** Shawn plotted four points and recorded the coordinates as: $A(2.5, 2.5)$, $B(0, 1.5)$, $C(-1, -1)$, $D(-2, -2)$.



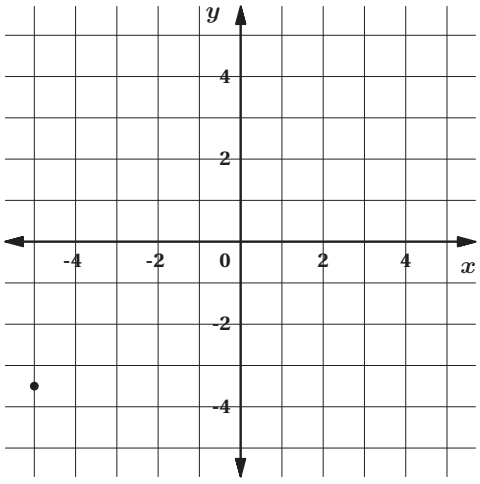

Some of the coordinates Shawn wrote are incorrect. For each point, state whether Shawn's ordered pairs are *correct* or *incorrect*. For any incorrect pair, explain what Shawn's mistake might have been.

**a** Point $A$

**b** Point $B$

**c** Point $C$

**d** Point $D$




**6.** Plot and label the points $E(0, 1.5)$ and $F(0, -0.5)$ on the coordinate plane.

**7.** Refer to the point plotted on the coordinate plane. Bard says the point is located at $(-5, -4.5)$. Is Bard correct? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 7.12

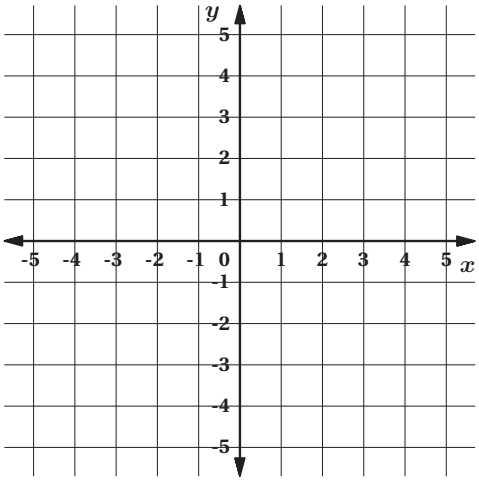
**1.** The vertices of a rectangle are located at $(-2, 2)$, $(-2, -4)$, $(2, -4)$, and $(2, 2)$.

**a** What is the length and width of the rectangle?

**b** What is the perimeter of the rectangle?

**c** What is the area of the rectangle?

**2.** Refer to the coordinate plane.




**a** Draw a square with a perimeter of 24 units and one vertex located at the point $(4, 4)$.

**b** Write the coordinates of the other vertices.

**c** What is the area of the square?

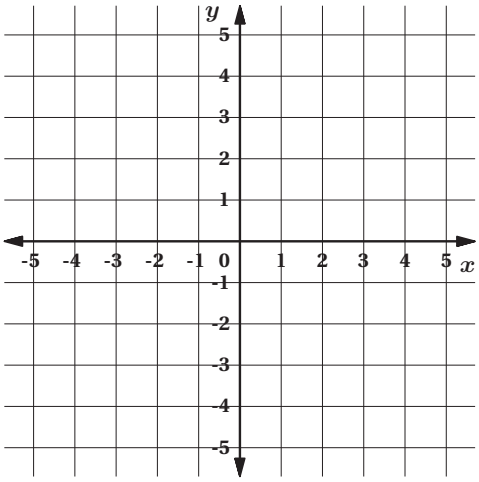
**3.** The vertices of a rectangle are located at $(-3, 2)$, $(3, 2)$, $(-3, -5)$, and $(3, -5)$.

**a** What is the length and width of the rectangle?

**b** What is the perimeter of the rectangle?

**c** What is the area of the rectangle?

**4.** Refer to the coordinate plane.

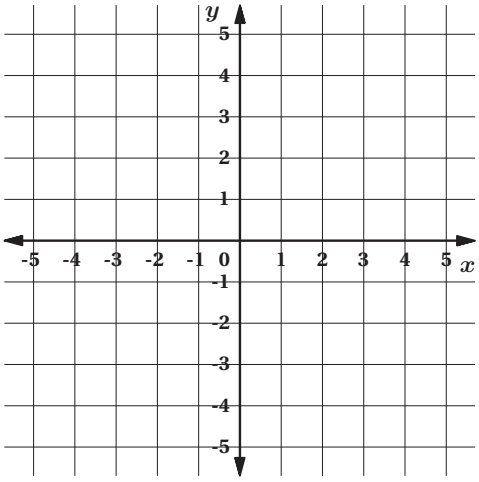



**a** Draw a square with a perimeter of 20 units and one vertex located at the point $(-1, 1)$.

**b** Write the coordinates of the other vertices.

**c** What is the area of the square?

**Use this coordinate plane for Problems 5 and 6.**



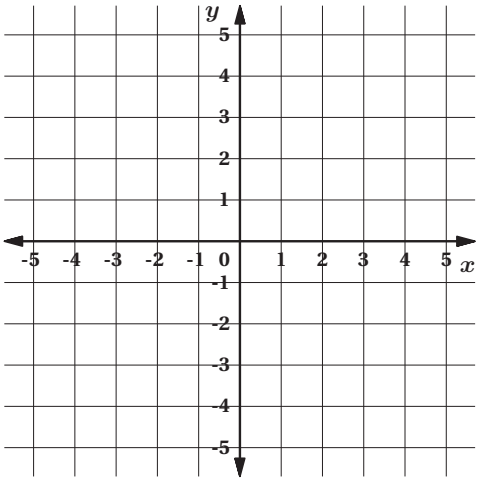

**5.** Plot and connect the following points in the order they are listed to form a polygon: $(3, 3)$, $(3, -4)$, $(-4, -4)$, $(-4, 1)$, $(1, 1)$, $(1, 3)$.

**6.** The line segments formed a polygon.

**a** What is the perimeter of the polygon?

**b** What is the area of the polygon?

**Use this coordinate plane for Problems 7 and 8.**




**7.** Plot and connect these points in the order they are listed to form the two polygons described. Label the polygons A and B.

**Polygon A:** $(-5, 5)$, $(-4, 5)$, $(-4, -1)$, $(1, -1)$, $(1, -4)$, $(-5, -4)$

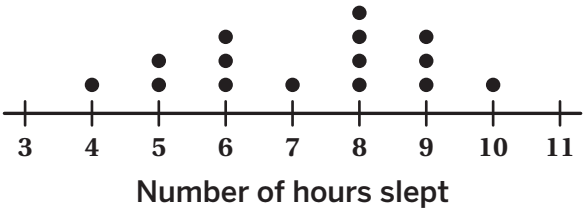
**Polygon B:** $(-3, 5)$, $(-3, 4)$, $(2, 4)$, $(2, -4)$, $(5, -4)$, $(5, 5)$

**8.** Jada claims that Polygon A and Polygon B has the same perimeter. Is she correct? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.02

**Use this dot plot for Problems 1–2.**




Number of hours slept

**1.** Shawn surveyed several students to determine the number of hours students slept the previous night.

**a** How many students did Shawn survey?

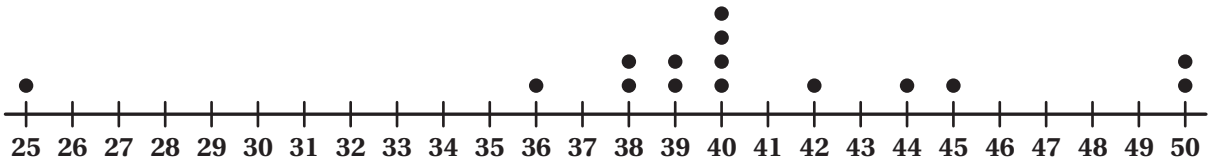
**b** What was the typical number of hours students slept?

**c** What percent of the students slept less than 6 hours?

**d** What percent of the students slept 7 or more hours?

**2.** Shawn slept for 10 hours last night. Shawn claims to have slept about the typical amount as all the other students surveyed. Do you agree with Shawn? Explain your thinking.

**3.** A group of students was asked, "How many songs are on your favorite playlist?" The results are shown on this dot plot. Select *all* the statements that are true.

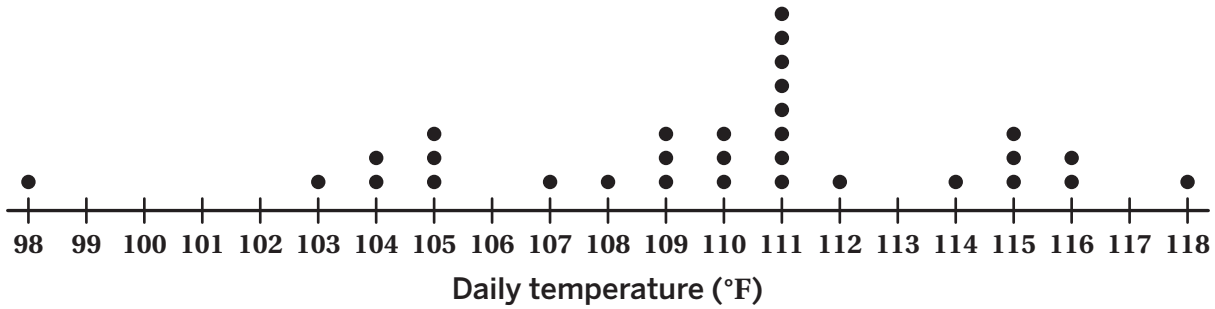



Number of songs in playlist

- ☐ **A.** 9 students were asked about the number of songs on their playlist.
- ☐ **B.** The most occurring number of songs on the playlist is 40.
- ☐ **C.** Typically, there are between 42 and 50 songs on a playlist.
- ☐ **D.** One-third of students had more than 40 songs on their playlist.
- ☐ **E.** More than half of the students had between 38 and 40 songs on their playlist.

Name: Date: Period:

**This dot plot shows the daily high temperatures in Phoenix, AZ, in July. Use this dot plot for Problems 4–5.**




**4.** Refer to the dot plot.

**a** What was the lowest daily temperature?

**b** Which temperature occurred most often?

**c** How many days had a temperature less than $110°$?

**d** What fraction of days had temperatures of $114°$ or higher?

**e** What was a typical temperature in July?

**5.** The temperature on June 30, was $100°\text{F}$. How does the temperature on June 30 compare to the temperatures in July? Select *all* that apply.

- ☐ **A.** The temperature on June $30$ was much higher than the typical temperature in July.
- ☐ **B.** The temperature on June $30$ was within the range of temperatures in July.
- ☐ **C.** The typical temperature in July was much higher than the temperature on June $30$.
- ☐ **D.** The minimum temperature in July was higher than the temperature on June $30$.
- ☐ **E.** There are thirteen days in July that had a higher temperature than June $30$.

**6.** Here are descriptions of data sets. Select *all* the descriptions that could be displayed as dot plots.

- ☐ **A.** Shoe size of each student in a sixth grade class.
- ☐ **B.** Eye color of a group of students in the cafeteria.
- ☐ **C.** How students get to school each day.
- ☐ **D.** Number of soccer goals a team scored at each game during their season.
- ☐ **E.** A month of overnight low temperatures for a city in Florida.

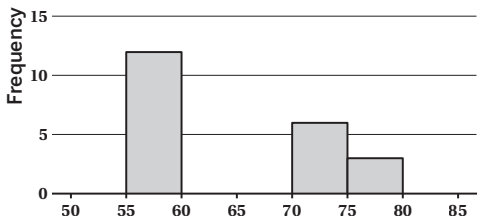
**7.** Clare said the results to the question, "What is the height of all the students in third grade?" cannot be displayed on a dot plot because most of the students in the class are the same height. Do you agree with Clare? Explain your thinking.

Name: ..... Date: ..... Period: .....

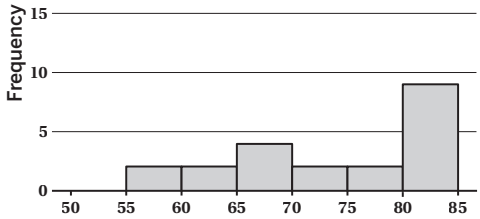
# Additional Practice 8.05

**1.** Match each histogram with a dot plot that represents the same data set.

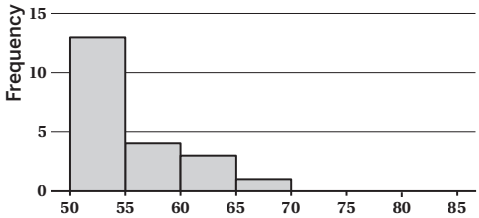
a



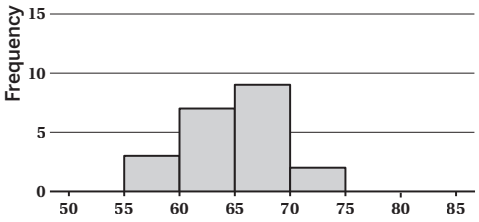

b

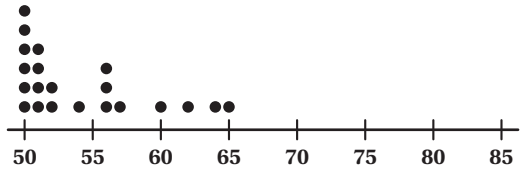


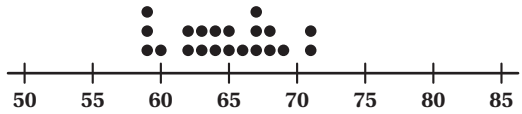

c

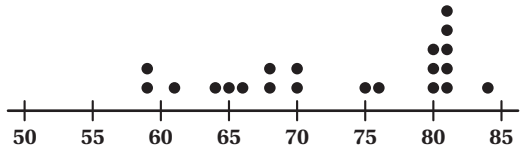


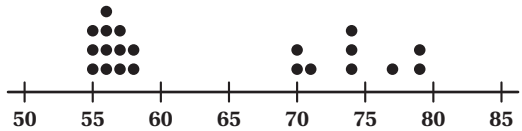

d



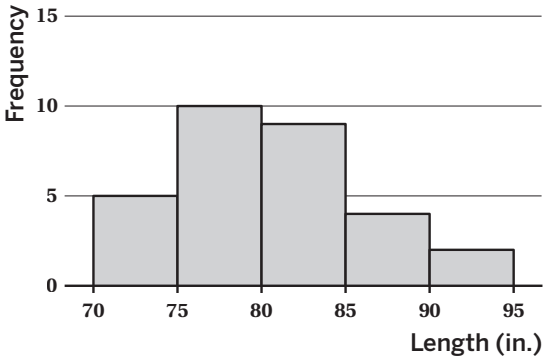




**2.** The histogram summarizes the lengths, in inches, of a group of West Atlantic bluefin tuna. Select *all* the statements that are true about the histogram.

- ☐ **A.** The majority of tuna were between 75 and 85 in. long.
- ☐ **B.** The longest tuna was over 8 ft long.
- ☐ **C.** 10 tuna were 75 in. long.
- ☐ **D.** A total of 30 tuna were measured.
- ☐ **E.** A total of 5 tuna were measured.
- ☐ **F.** Five tuna were less than 75 in. long.



Name: Date: Period:

**This table shows the age of players, in years, on a professional basketball team. Use this information for Problems 3–4.**

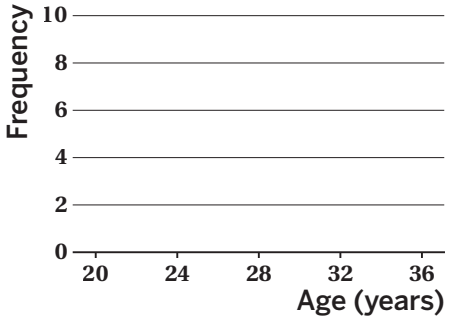
| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 22 | 22 | 24 | 24 | 25 | 30 | 30 | 29 |
| 25 | 27 | 32 | 27 | 35 | 26 | 26 | 21 |

**3.** Complete the frequency table and use it to make a histogram of the ages of the players.

a

| Age (years) | Frequency |
|---|---|
| 20 to less than 24 | |
| 24 to less than 28 | |
| 28 to less than 32 | |
| 32 to less than 36 | |

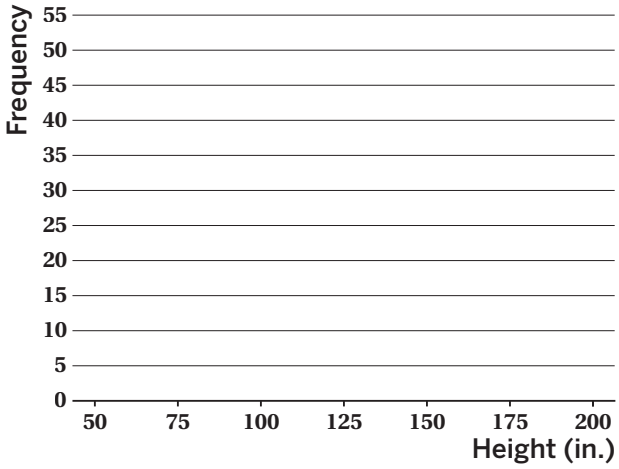
b




**4.** What is a typical age of a player on the team? Explain your thinking.

**5.** The frequency table shows the heights of peach trees, in inches, on an acre of land. Use the frequency table to make a histogram of the heights of the peach trees.

| Height (in.) | Frequency |
|---|---|
| 50 to less than 75 | 40 |
| 75 to less than 100 | 50 |
| 100 to less than 125 | 20 |
| 125 to less than 150 | 14 |
| 150 to less than 175 | 10 |
| 155 to less than 200 | 7 |




**6.** Refer to the histogram from Problem 5. An average peach tree is between 144 and 180 in. tall. Bard says that there are 24 peach trees between these heights. Is Bard correct? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.07

**1.** Which expressions could you use to calculate the mean of this data set? Select *all* that apply.

$12, 9, 15, 16, 12, 13$

- ☐ **A.** $(12 + 9 + 15 + 16 + 12 + 13) \cdot 6$
- ☐ **B.** $(12 + 9 + 15 + 16 + 12 + 13) \div 6$
- ☐ **C.** $\frac{12 + 9 + 15 + 16 + 12 + 13}{6}$
- ☐ **D.** $77 \cdot 6$
- ☐ **E.** $77 \div 6$

**2.** This data set represents the daily high temperatures for Minneapolis, Minnesota, in degrees Celsius.

| | | | | | | |
|---|---|---|---|---|---|---|
| 6 | 9 | 8 | 10 | 8 | 6 | 9 |

What was the average high temperature? Show your thinking.

**3.** The mean of four numbers is $12$. Three of the numbers are $8$, $12$, and $12$. What is the fourth number? Show or explain your thinking.

**4.** This data set represents the number of goals a soccer team scored at each game during their season.

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | 5 | 8 | 2 | 4 | 3 | 1 |
| 0 | 1 | 1 | 5 | 3 | 2 | 4 |

What was the average number of goals scored at each game?
Show your thinking.

**5.** An art teacher is rearranging four bags of popsicle sticks so that each bag contains an equal number of sticks. Currently Bag A has 45 sticks, Bag B has 25 sticks, Bag C has 16 sticks, and Bag D has 34 sticks. Select *all* the ways the art teacher could make each bag have the same number of popsicle sticks.

- ☐ **A.** Remove 5 popsicle sticks from Bag D and 15 popsicle sticks from Bag A. Redistribute the 20 sticks that were removed into Bags B and D so there are 30 sticks in each bag.
- ☐ **B.** Remove 5 popsicle sticks from Bag D and place them in Bag B.
- ☐ **C.** Remove 15 popsicle sticks from Bag A and place them in Bag B. Remove 5 popsicle sticks from Bag D and place them in Bag C.
- ☐ **D.** Remove 15 popsicle sticks from Bag A and place them in Bag C. Remove 5 popsicle sticks from Bag D and place them in Bag B.
- ☐ **E.** Remove all the popsicle sticks and make four equal piles, which will contain 30 sticks. Then put each pile in one of the bags.

**6.** Noah babysat 6 times. He earned $24, $25, $31, $32, and $28 for the first 5 babysitting jobs. How much did Noah earn at the sixth babysitting job if the average amount he earned was $27? Show your thinking.

**7.** In her math class, Priya's teacher gives 5 quizzes, each worth 10 points. After 4 of her quizzes, Priya has scores of 7, 10, 8, and 6. How many points does Priya have to score on the last quiz to have an average score of 8? Show or explain your thinking.

**8.** While playing a card game, Shawn kept score for the first 5 hands, as shown in the table. Shawn claims that the mean score per hand is 15.

| | | | | |
|---|---|---|---|---|
| 14 | 10 | 15 | 20 | 16 |

Is Shawn correct? If yes, explain how Shawn is correct. If not, explain how to calculate the correct mean.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.09

**Problems 1–4.** This table shows the amount of time it takes **5** laptops to charge to **100**%. The mean charge time is **30** minutes.

| Charge Time (min) | 30 | 31 | 29 | 29 | 31 |
|---|---|---|---|---|---|

**1.** Fill in the absolute deviation of each value from the mean.

| Charge Time (min) | 30 | 31 | 29 | 29 | 31 |
|---|---|---|---|---|---|
| Absolute Deviation | | | | | |

**2.** What is the sum of the absolute deviations?

**A.** 0

**B.** 3

**C.** 4

**D.** 5

**3.** Calculate the mean absolute deviation (MAD) of this data set. Show your work.

**4.** Based on the calculated MAD, how are the data points spread around the mean?

**A.** The MAD is a smaller value, so the data points are *less* spread out around the mean.

**B.** The MAD is a smaller value, so the data points are *more* spread out around the mean.

**C.** The MAD is a larger value, so the data points are *less* spread out around the mean.

**D.** The MAD is a larger value, so the data points are *more* spread out around the mean.

Name: Date: Period:

**Problems 5–7.** Mia would like to know how long her classmates studied for an upcoming French exam. This table shows the amount of time **5** students studied for the exam. Their mean study time was **90** minutes.

| Study Time (min) | 80 | 92 | 111 | 140 | 27 |
|---|---|---|---|---|---|

**5.** Fill in the absolute deviation of each value from the mean.

| Study Time (min) | 80 | 92 | 111 | 140 | 27 |
|---|---|---|---|---|---|
| Absolute Deviation | | | | | |

**6.** What is the sum of the absolute deviations?

**A.** 28.7

**B.** 29.2

**C.** 30.4

**D.** 31.6

**7.** Describe how the calculated MAD measures the spread of the data around the mean study time.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.11

**1.** Select *all* the true statements about the median.

- ☐ **A.** The median is the middle number.
- ☐ **B.** If there are 9 data points, calculate the average of the two in the middle.
- ☐ **C.** The data set needs to be in numerical order before determining the median.
- ☐ **D.** The median represents both a measure of center and a typical number.
- ☐ **E.** The mean and median are always the same.

**2.** This data set shows the number of tornadoes in Texas over the last several years.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 89 | 184 | 58 | 186 | 106 | 258 | 47 | 84 | 121 |

**a** Order the data from least to greatest.

**b** Calculate the median of the data set.

**3.** Diego's score for each hole in mini golf is shown.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3 | 4 | 1 | 6 | 4 | 6 | 3 | 3 | 2 |
| 5 | 4 | 3 | 5 | 7 | 2 | 4 | 4 | 1 |

What was his median score?

- ☐ **A.** 3
- ☐ **B.** 4
- ☐ **C.** 6
- ☐ **D.** 9

**4.** Shawn and Lin are reading a trilogy of books. The tables list the number of minutes each of them read on several days over the past few weeks.

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Shawn | 30 | 30 | 25 | 15 | 40 | 35 | 20 | 20 | 30 | 25 | 35 | 40 |
| Lin | 15 | 15 | 25 | 20 | 15 | 40 | 30 | 40 | 40 | 30 | 25 | 20 |

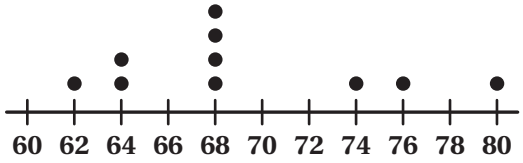
**a** Determine the median of each data set.

**b** Who typically read more? Explain your thinking.

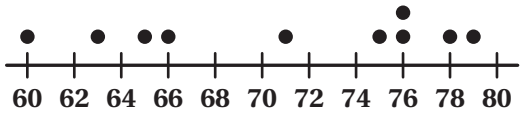
Name: ..... Date: ..... Period: .....

**5.** Match each dot plot with its median.

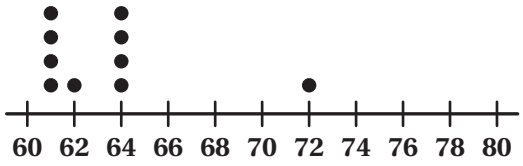
a



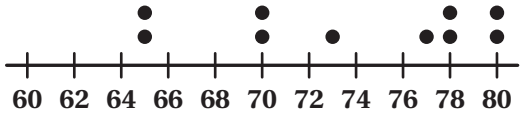

b .....




c .....

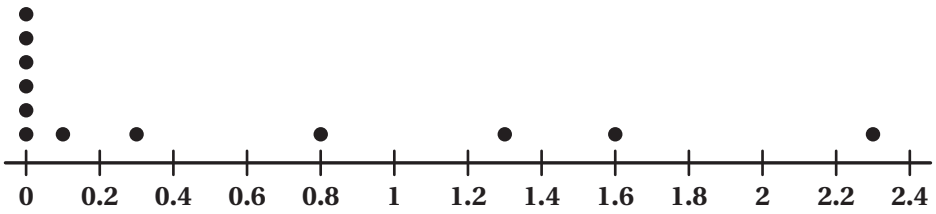



d .....




.....

**6.** This dot plot shows the average snowfall days each month for Portland, Oregon. Determine the median for the data set.




**7.** Elena is researching which backpack would be the best one to buy. She sorted the price of several backpacks and noticed that 6 backpacks were more expensive than the one she purchased, and 8 backpacks were less expensive than the one she purchased. Does this mean that the price of Elena's backpack is the median? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.13

**1.** This data set represents the scores of several students in a class on a 10-point quiz.

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | 5 | 6 | 7 | 7 | 7 | 8 | 9 | 9 | 9 | 9 | 10 | 10 | 10 | 10 |

**a** What is the median score?

**b** What is the first quartile (Q1)?

**c** What is the third quartile (Q3)?

**d** What is the interquartile range (IQR)?

**2.** This data set represents the number of goals a soccer team scored at each game during their season.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3 | 5 | 8 | 2 | 4 | 3 | 1 | 0 | 1 | 1 | 5 | 3 | 2 | 4 |

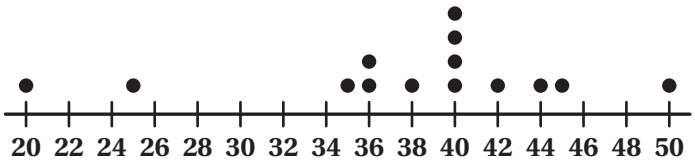
**a** What is the median score?

**b** What is the first quartile (Q1)?

**c** What is the third quartile (Q3)?

**d** What is the interquartile range (IQR)?

**3.** A group of students was asked, "How many songs are on your favorite playlist?" The results are shown on this dot plot.




Number of songs on playlist

**a** What is the median score?

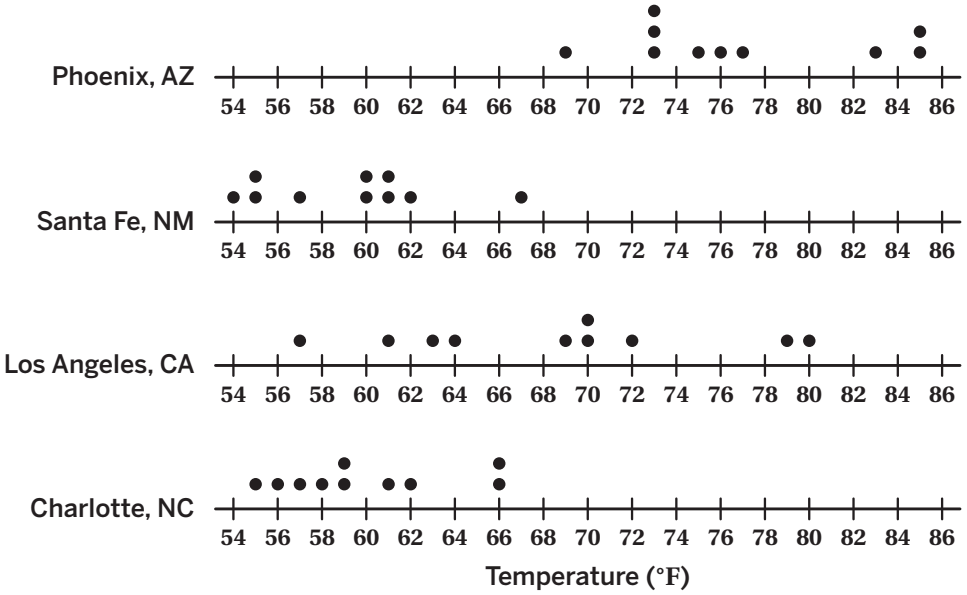
**b** What is the first quartile (Q1)?

**c** What is the third quartile (Q3)?

**d** What is the interquartile range (IQR)?

Name: ..... Date: ..... Period: .....

**4.** These dot plots represent the daily high temperatures in degrees Fahrenheit for four different cities in March. Match each dot plot with the correct median and IQR by writing the city's name next to each set of statistics.



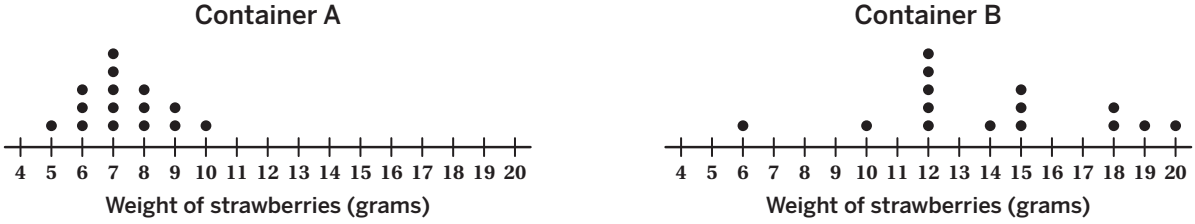

**a** Median: 59; IQR: 5

**b** Median: 60; IQR: 6

**c** Median: 69.5; IQR: 9

**d** Median: 75.5; IQR: 10

**5.** Tyler weighs strawberries from two different containers and records the weights on the dot plots. Which statement is true about the data sets?




**A.** Container A has a greater range.

**B.** Container A has a greater IQR.

**C.** Container A has a greater median.

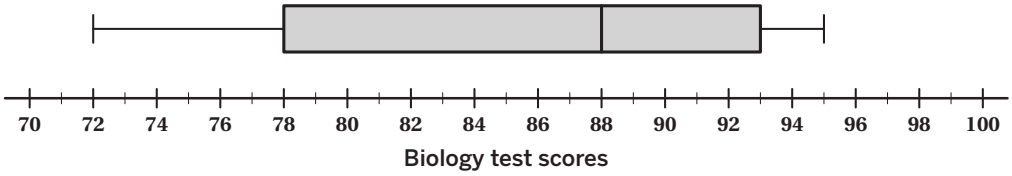
**D.** Container A has less variability.

**6.** Kiran and Clare exercised daily for the last 10 days and recorded how long they exercised each day. Kiran's median time was 50 minutes, with an IQR of 15. Clare's median time was 50 minutes, with an IQR of 25. Clare said her exercise time had less variability. Do you agree with Clare? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.14

**1.** This box plot summarizes the scores for a class on a recent biology test.

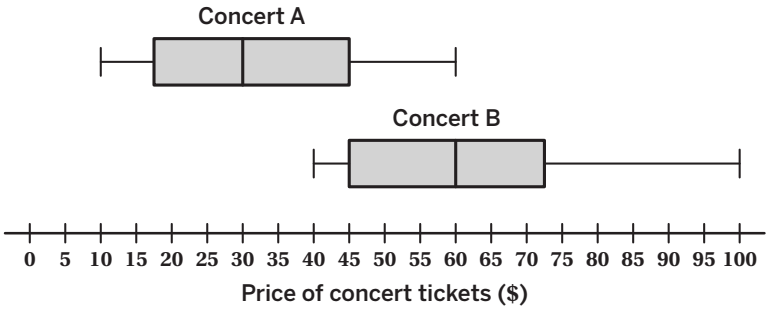



a. What is the greatest score in this class?

b. What is the median score in this class?

c. What is the interquartile range (IQR) for this class?

**2.** The box plots summarize the price of 250 tickets sold for two different concerts




a. How many tickets were sold for Concert A between $30 and $60?

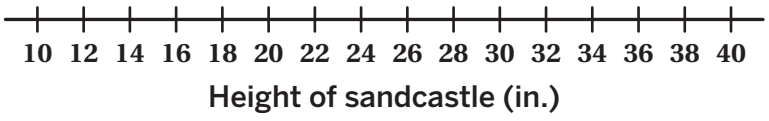
b. What percent of tickets were sold for Concert B under $60?

c. How many tickets were sold for Concert B between $45 and $100?

d. What percent of tickets were sold for Concert A over $45?

**3.** The data shows the height, in inches, of several sandcastles built on the beach. Create a box plot to represent this data.

| | | |
|---|---|---|
| 18 | 34 | 30 |
| 28 | 15 | 30 |
| 36 | 24 | 22 |

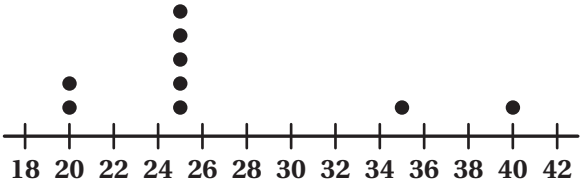


Name: Date: Period:

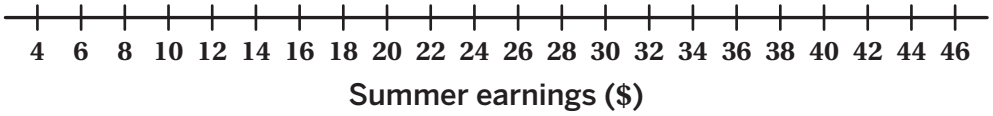
**The data shows the amount of money Diego and Elena earned for doing odd jobs over the course of the summer. Use this information for Problems 4–6.**

**Diego:**
**Minimum:** 10 **Q1:** 17 **Median:** 25 **Q3:** 30 **Maximum:** 45

**Elena:**




**4.** Create two box plots above the same number line to represent both sets of data. Make sure to label the box plot with *Diego* and *Elena*.




**5.** Which of the following statements are true about the box plots? Select *all* that apply.

- ☐ **A.** The IQR is the same for both data sets.
- ☐ **B.** The median is the same for both data sets.
- ☐ **C.** Diego earned a greater range of money over the summer.
- ☐ **D.** About 50% of the money Elena earned was more than $23.
- ☐ **E.** About 25% of the money Diego earned was less than $30.

**6.** Diego says that 25% of the money that he and Elena earned is between $25 and $40. Do you agree with this statement? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.10

**1.** Identify each statement as *true* or *false*. Explain your thinking.

**a** When information is being gathered about a group, the entire group is called the sample.

**b** Samples from the same population will vary from sample to sample.

**c** Different random samples of the same size and from the same population will be the same.

**2.** The student council at a local middle school surveyed a random sample of 100 students to see how they felt about the lunch offerings. Identify the population and sample in this scenario.

**A.** The population represents all of the seventh graders at the middle school. The sample represents the students surveyed.

**B.** The population represents all of the students surveyed. The sample represents all of the students at the school.

**C.** The population represents all of the students at the school. The sample represents the students surveyed.

**D.** The population represents all of the students at the school. The sample represents all of the seventh graders.

**A bakery makes hundreds of muffins each day, including bran, blueberry, and cinnamon, as well as several other kinds. They are curious which muffin tastes the best to their customers. Consider this scenario for Problems 3–4.**

**3.** Which statement best describes the population?

**A.** The population represents all of the bakers at the bakery.

**B.** The population represents all of the muffins that are made at the bakery.

**C.** The population represents all of the bran, blueberry, and cinnamon muffins.

**D.** The population represents one kind of muffin made at the bakery.

**4.** Which statement *best* describes the sample?

**A.** The sample represents all of the muffins made at the bakery.

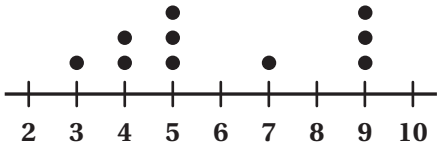
**B.** The sample represents one bran muffin, one blueberry muffin, and one cinnamon muffin.

**C.** The sample represents all of the customers that come into the bakery on one day.

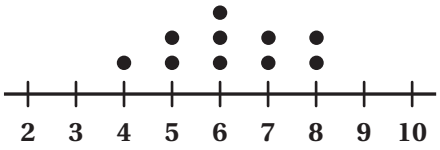
**D.** The sample represents randomly selected batches of muffins.

Name: Date: Period:

**A random selection of students counted the number of letters in their first and last name. The results are shown in the following dot plots. Refer to the dot plots for Problems 5–6.**




Number of letters in first name




Number of letters in last name

**5.** Calculate the mean and the mean absolute deviation (MAD) of each data set. Record the results in the table.

**6.** Which mean is greater, and by how much? Explain what the difference in the means tells you about the data.

| | Mean | MAD |
|---|---|---|
| Letters in first name | | |
| Letters in last name | | |

**A random selection of students from two different grades reported their height, in inches. The results are shown in the table. Refer to the table for Problems 7–8.**

| Seventh graders | Eighth graders |
|---|---|
| 59, 58, 58, 60, 64, 58 | 63, 68, 64, 61, 65, 62 |

**7.** Calculate the mean and the mean absolute deviation (MAD) of each data set. Record the results in the table.

**8.** Which mean is greater, and by how much? Explain what the difference in the means tells you about the data.

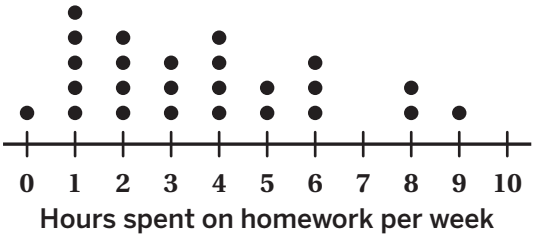
| | Mean | MAD |
|---|---|---|
| Seventh graders | | |
| Eighth graders | | |

Name: ..... Date: ..... Period: .....

# Additional Practice 8.11

**1.** Lin's school had a fundraiser where about 60% of students paid $1 to wear a hat all day at school. Lin selects a representative sample of 45 students and determines the sample's percentage of the students who paid $1. Lin's sample showed that 80% of students paid $1. Is this a good sample? Explain your thinking.

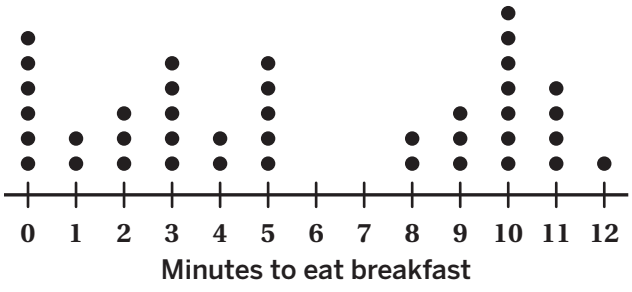
**2.** Tyler was asked how many hours students at his school spend on homework each week. The sample shown consists of 25 students and is representative of the population.




Because this sample is representative of the population, what might a dot plot for the entire population look like? Select *all* that apply.

- ☐ **A.** The center will be around 4.5.
- ☐ **B.** Very few data values will be below 8.
- ☐ **C.** The population will have more data on the left.
- ☐ **D.** The range will be from 0 to 9.

**3.** Shawn was asked how long it takes students at school to eat breakfast. The sample shown consists of 40 students and is representative of the population. Because this sample is representative of the population, complete these sentences to describe what a dot plot for the entire population would look like.

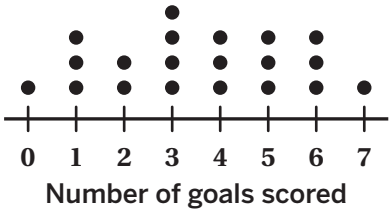



**a** The range will be from ..... to .....

**b** The center will be around ..... (Round to the nearest tenth.)

Name: ..... Date: ..... Period: .....

**Priya surveyed soccer players to see how many goals they scored during their most recent soccer season. The results of the survey are shown in the dot plot. Refer to the dot plot for Problems 4–5.**

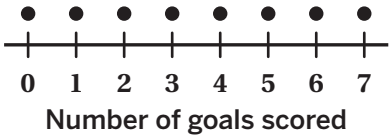



**4.** Calculate the mean and MAD for this data set.

**a** Mean .....

**b** MAD .....

**5.** Priya chose the sample shown to represent the number of goals scored. Priya thinks this dot plot shows a sample that is representative of the population. Do you agree with Priya? Explain your thinking.




**Consider the following for Problems 6–8. There are 24 students in Tyler's math class. The average test score on the last test was 91.**

**6.** Mai scored 100 on the test, and Noah scored 98. Are their scores representative of the 24 students? Show or explain your thinking.

**7.** Diego scored 81 on the test, Clare scored 94 on the test, and Tyler scored 98 on the test. Are their scores representative of the 24 students? Show or explain your thinking.

**8.** Andre scored 90 on the test, Elena scored 88 on the test, Han scored 90 on the test, and Jada scored 92 on the test. Are their scores representative of the 24 students? Show or explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.12

**1.** Diego surveyed a random sample of 20 students, and asked them whether they prefer math or science. Twelve students said they preferred math. Clare did not think Diego's estimate was very accurate, so she surveyed a random sample of 80 students, and 42 said they preferred math.

**a** Based on Diego's sample, estimate what fraction of the students preferred math.

**b** Based on Clare's sample, estimate what fraction of the students preferred math.

**c** Whose estimate is more likely to be accurate? Explain your thinking.

**Andre and Elena surveyed a random sample of 24 students at each of their schools, asking each student how many people are in their household. Refer to the tables for Problems 2–4.**

**Andre's sample**

| | | | | | |
|---|---|---|---|---|---|
| 6 | 2 | 6 | 8 | 2 | 3 |
| 4 | 3 | 3 | 7 | 3 | 6 |
| 6 | 4 | 5 | 4 | 5 | 4 |
| 5 | 8 | 5 | 4 | 4 | 4 |

**Elena's sample**

| | | | | | |
|---|---|---|---|---|---|
| 4 | 4 | 3 | 6 | 4 | 6 |
| 4 | 4 | 5 | 6 | 2 | 4 |
| 3 | 6 | 4 | 3 | 5 | 2 |
| 5 | 2 | 8 | 4 | 5 | 4 |

**2.** For each sample, what fraction of the students have 4 people in their household?

**a** Andre's sample:

**b** Elena's sample:

**3.** There are 1,050 students at Andre's school. Estimate the number of students at Andre's school who have the following number of people in their household.

**a** 3 people in their household.

**b** 4 people in their household.

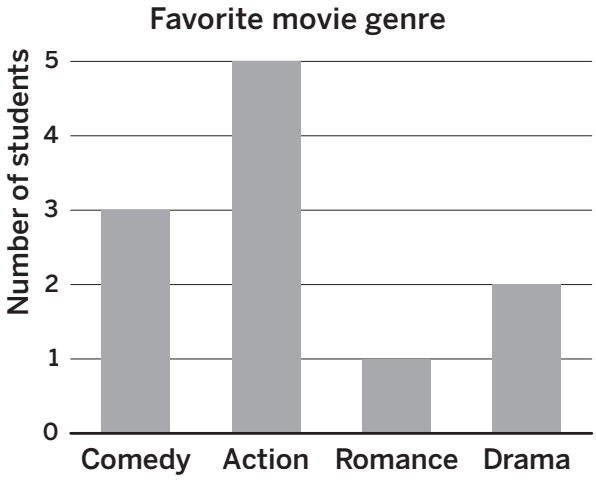
**4.** There are 975 students at Elena's school. Estimate the number of students at Elena's school who have the following number of people in their household.

**a** 6 people in their household.

**b** 4 people in their household.

Name: ..... Date: ..... Period: .....

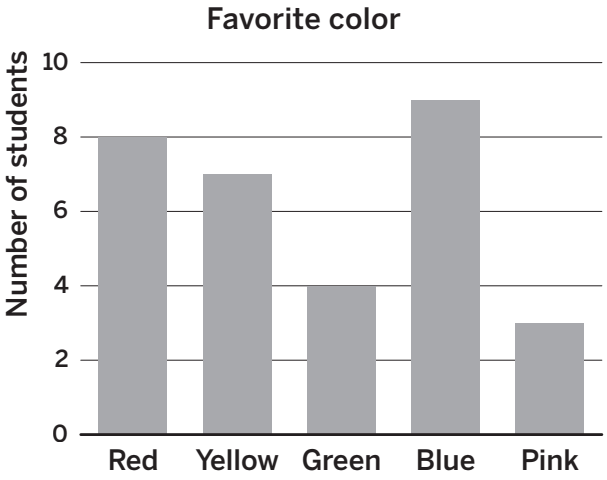
**There are 978 students at Han's school. Han surveyed a random sample of students about their favorite movie genre. The bar graph shows the results. Refer to the bar graph for Problems 5–6.**




**5.** Estimate the total number of students in the school who would choose action as their favorite movie genre.

**6.** Estimate the total number of students in the school who would choose romance or drama as their favorite movie genre.

**There are 868 students at Shawn's school. Shawn surveyed a random sample of students about their favorite color. The bar graph shows the results. Refer to the bar graph for Problems 7–8.**




**7.** Shawn estimates that 196 students would choose yellow as their favorite color. Do you think Shawn's estimate is likely to be accurate? Explain your thinking.

**8.** Shawn estimates that 504 students would choose red or blue as their favorite color. Do you think Shawn's estimate is likely to be accurate? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.14

**Problems 1–3:** Clare loves to read. This data shows the number of pages Clare read each week during her winter and spring breaks.

| Winter | | | | |
|---|---|---|---|---|
| 260 | 200 | 250 | 240 | 290 |
| 200 | 190 | 190 | 250 | 300 |
| **MAD 33.6** | | | | |

| Spring | | | | |
|---|---|---|---|---|
| 200 | 260 | 250 | 240 | 280 |
| 190 | 210 | 200 | 250 | 260 |
| **MAD 27.2** | | | | |

**1.** Determine the mean number of pages that Clare read during her winter and spring breaks.

**2.** Calculate how many MADs apart the means are. Use the larger MAD in your calculation.

**3.** Based on this data, did Clare read more pages during her winter break or her summer break? Explain your thinking.

Name: Date: Period:

**Problems 4–5:** Han compared the time that students and teachers spent driving to school each day over a week period. He took a random sample of 20 students and 20 teachers. She collected the data and placed his results in the table.

| | Mean (min) | MAD (min) |
|---|---|---|
| Students | 22.7 | 8.3 |
| Teachers | 34.5 | 7.4 |

**4.** How many MADs apart are the means? Use the larger MAD in your calculation.

**A.** 1.42 MADs

**B.** 1.59 MADs

**C.** 6.89 MADs

**D.** 7.73 MADs

**5.** Is there a big difference between the students' data and the teachers' data? Circle one.

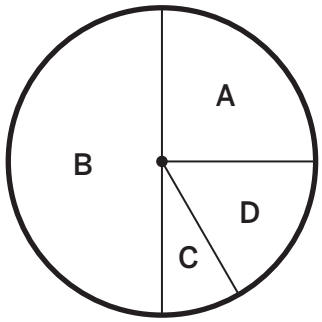
Yes No Maybe

Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.02

**Refer to the spinner for Problems 1–3.**




**1.** Determine whether each event is *impossible*, *possible*, or *certain*.

**a** Landing on *A*

**b** Landing on *B*

**c** Landing on *C*

**d** Landing on *D*

**e** Landing on a number

**f** Landing on a letter

**2.** Order these events from *least likely* to *most likely*.

Landing on *A*, Landing on *B*, Landing on *C*, Landing on *D*

| | |
|---|---|
| | **Least likely** |
| | |
| | |
| | **Most likely** |

**3.** Mai spun the spinner one time and it landed on *C*. She claims that it is certain that the spinner will land on *C* on her next spin. Do you agree with Mai? Explain your thinking.

**4.** Andre will randomly select a letter from the word *COUCH*. Shawn will randomly select a letter from the word *CHAIR*. Which person is more likely to select the letter *C*? Explain your thinking.

Name: ..... Date: ..... Period: .....

**5.** Determine whether each event is *impossible*, *unlikely*, *equally likely as not*, *likely*, or *certain*.

**a** Selecting a white marble from a bag containing 5 red marbles and 6 black marbles.

**b** Selecting a vowel from the word *WORK* or from the word *MATH*.

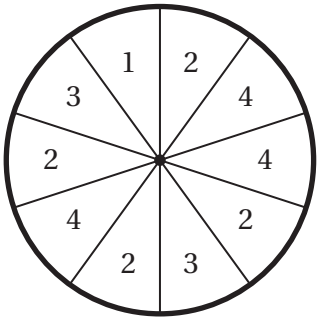
**c** Rolling a 6 on a 10-sided die.

**d** A spinner has 6 equal-sized sections labeled 1 through 6. You spin the spinner and it lands on an even number.

**e** Selecting a black marble from a bag containing only black marbles.

**f** Selecting a consonant from the word *STUDY*.

**6.** A spinner has 10 equal-sized sections. Order these events from *least likely* to *most likely*.




Landing on 1, Landing on 2, Landing on 3, Landing on 4

| | |
|---|---|
| | **Least likely** |
| | |
| | |
| | **Most likely** |

**7.** A letter will randomly be selected from the word *ALGEBRA*. Describe the likelihood that the letter *A* will be chosen using the words *impossible*, *possible*, or *certain*. Explain your thinking.

**8.** There are 12 girls and 13 boys in Priya's homeroom class. If a student is selected at random, Priya says it will be unlikely that a girl will be selected because there are more boys in the class. Is Priya correct? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.03

**The student council is surveying seventh grade students about what they typically do after dismissal. They surveyed students from two different schools in the district. The tables summarize the responses given by students on the survey. Use the information for Problems 1–4.**

School 1

| Activity | Number of students |
|---|---|
| Practice a sport | 21 |
| Play video games | 9 |
| Start homework | 10 |
| Watch a younger sibling | 4 |
| Hang out with friends | 16 |
| Other | 5 |
| **Total** | **65** |

School 2

| Activity | Number of students |
|---|---|
| Practice a sport | 6 |
| Play video games | 4 |
| Start homework | 3 |
| Watch a younger sibling | 4 |
| Hang out with friends | 10 |
| Other | 3 |
| **Total** | **30** |

**1.** Suppose you randomly selected one seventh grader from the district. What is the probability that their typical after-school activity would be playing video games? Explain your thinking.

**2.** Suppose you randomly selected one seventh grader from the district. What is the probability that their typical after-school activity would be watching a younger sibling? Explain your thinking.

**3.** Suppose you randomly selected one seventh grader from each school. Which school has a greater probability that students will be hanging out with friends after school? Explain your thinking.

**4.** Suppose you randomly selected one seventh grader from each school. Which school has a greater probability that students will be practicing a sport after school? Explain your thinking.

**5.** A spinner has six equal sections, with one letter from the word *HONEST* in each section.

**a** Suppose you spin the spinner 24 times. About how many times do you expect it will land on *T*?

**b** Suppose you spin the spinner 72 times. About how many times do you expect it will land on something other than *T*?

**6.** A spinner has eight equal sections, with one letter from the word *RESEARCH* in each section.

**a** Suppose you spin the spinner 12 times. About how many times do you expect it will land on an *E*?

**b** Suppose you spin the spinner 96 times. About how many times do you expect it will land on something other than an *E*?

**c** Andre spun the spinner 32 times. The spinner landed on an *E* ten times. Is this greater or less than the expected probability? Explain your thinking.

**7.** A number cube labeled 1 through 6 is rolled once.

**a** What is the probability of rolling a 3?

**b** Han rolled the number cube 48 times. It landed on 3 four times. Is this greater or less than the expected probability? Explain your thinking.

**8.** Clare and Elena plan an experiment tossing a coin 60 times. Clare thinks the coin will land tails up exactly 30 times. Elena thinks the coin will land tails up close to 30 times. With whom do you agree? Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.05

**1.** A survey asked students their music genre preference. The results in the table show that 30 students like pop, 15 students like country, 21 students like rap, and 9 students prefer other genres. Complete the table by finding the relative frequency for each music genre. Write each relative frequency as a decimal.

| Music genre | Number of occurrences | Relative frequency |
|---|---|---|
| Pop | 30 | |
| Country | 15 | |
| Rap | 21 | |
| Other | 9 | |
| **Total** | **75** | **1** |

**2.** The seventh-grade football team won 9 games and lost 3 games. What is the relative frequency of the games the team won? Select *all* that apply.

- ☐ **A.** $\frac{1}{3}$
- ☐ **B.** $0.25$
- ☐ **C.** $33\%$
- ☐ **D.** $0.75$
- ☐ **E.** $\frac{3}{4}$
- ☐ **F.** $25\%$
- ☐ **G.** $75\%$
- ☐ **H.** $0.33$
- ☐ **I.** $\frac{1}{4}$

**3.** A survey asked students how they get to school. The results showed 6 students walk, 9 students ride the bus, 3 students ride in a car, and 12 students ride a bike. Determine each relative frequency and write it as a percentage.

**a** The relative frequency of students who walk to school.

**b** The relative frequency of students who ride the bus.

**c** The relative frequency of students who ride in a car.

**d** The relative frequency of students who ride a bike.

Name: Date: Period:

**4.** A survey asked middle school students about their favorite book series, and the results are shown on the table. What is the relative frequency of the Dragon's Land series, rounded to the nearest percent?

| Book series | Frequency |
|---|---|
| Alex's Mysteries | 28 |
| The Soldier's Apprentice | 36 |
| The Land of Games | 16 |
| Dragon's Land | 42 |

**A.** 30%

**B.** 34%

**C.** 23%

**D.** 36%

**5.** Refer to this quote by Dr. Martin Luther King, Jr.
*Injustice anywhere is a threat to justice everywhere*.

**a** Determine the relative frequency of the letter *E* occuring. Write the relative frequency as a fraction in simplest form.

**b** Determine the relative frequency of the letter *T* occuring. Write the relative frequency as a fraction in simplest form.

**6.** Refer to this quote by the 35th U.S. President, John F. Kennedy.
*Ask not what your country can do for you, but what you can do for your country.*

Complete the table to show the number of occurrences and relative frequency for a few of the letters from the quote. Write each relative frequency as a fraction.

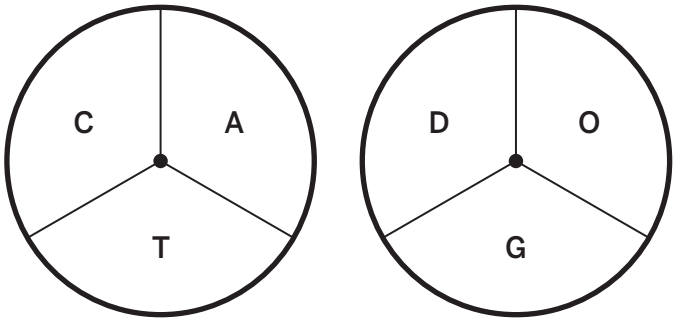
| Letter | Number of occurrences | Relative frequency |
|---|---|---|
| *N* | | |
| *C* | | |
| *U* | | |
| *O* | | |

**7.** Using the quote and table from Problem 6, identify two letters that have the same relative frequency, one of which is a letter from the table. Explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.06

**1.** Shawn spins the two fair spinners shown.




**a** List *all* of the possible outcomes.

**b** How many different possible outcomes are in the sample space?

**2.** Priya tosses a dime, rolls a standard number cube, and then tosses a penny. Use the table to list all of the possible outcomes.
**Note:** Use *H* for heads and *T* for tails.

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |

**3.** Refer to the tables shown. For each event, use any method to determine the sample space. Then determine the number of outcomes.

**a** Andre selects one type of milk and one type of cereal to make breakfast.

| Milk | Cereal |
|---|---|
| dairy<br>soy | granola<br>oatmeal<br>rice squares |

**b** Andre selects one type of base, one type of protein, and one type of vegetable to make a lunch bowl.

| Base | Protein | Vegetable |
|---|---|---|
| rice<br>lettuce | chicken<br>beans | tomatoes<br>corn |

**4.** Clare rolls a standard number cube and spins a spinner with the letters *G*, *O*, *E*, and *S* on it. She claims there are 10 possible outcomes. Is Clare correct? Explain your thinking.

**Refer to the following information for Problems 5–8.**

**A breakfast diner makes omelettes with one type of egg, one protein, one type of cheese, and one vegetable. Customers can choose from the options shown in the table.**

| Eggs | Proteins | Cheese | Vegetables |
|---|---|---|---|
| whole eggs<br>egg whites | bacon<br>sausage<br>tofu | American<br>Mozzarella<br>none | onions<br>peppers<br>mushrooms<br>tomatoes |

**5.** How many different omelettes are possible, assuming customers must choose one type of egg, one protein, one type of cheese, and one vegetable? Show or explain your thinking.

**6.** How many different omelettes include whole eggs, sausage or bacon, and onions? Show or explain your thinking.

**7.** Tyler wants an omelette that has egg whites and tomatoes. He does not have a preference for a protein or cheese. How many different omelettes could Tyler choose? Show or explain your thinking.

**8.** Suppose an omelette is made by randomly choosing each of the options. What is the ratio of the number of omelettes that Tyler could choose to the total number of possible omelettes? Show or explain your thinking.

Name: ..... Date: ..... Period: .....

# Additional Practice 8.07

**1.** A school district reports that 50% of students in the district ride the bus to school. In the table, an even number represents a student who rides the bus, and an odd number represents a student who does not ride the bus. Consider 0 an even number for this simulation. The digits in each cell represent 6 randomly selected students.

| | | | | |
|---|---|---|---|---|
| 312569 | 983454 | 509364 | 234577 | 983465 |
| 315467 | 444828 | 014559 | 235538 | 402080 |
| 375206 | 926739 | 816353 | 482544 | 565914 |
| 248931 | 127324 | 678358 | 864533 | 294584 |

**a** Based on the top-left cell in the table, what is the probability of students riding the bus?

**b** Based on this simulation, what is the probability that at least 4 out of 6 randomly selected students ride the bus to school?

**c** Based on this simulation, what is the probability that fewer than 3 out of 6 randomly selected students ride the bus?

**2.** The weather forecast stated that there is a 40% chance of rain tomorrow. Which simulation can be used to find the indicated probability?

**A.** A spinner divided into 2 equal-sized sections is spun 40 times.

**B.** A spinner divided into 4 equal-sized sections is spun 1 time.

**C.** A spinner divided into 5 equal-sized sections is spun 1 time.

**D.** A spinner divided into 8 equal-sized sections is spun 40 times.

**3.** Over the last three basketball games, Andre has made 16 free throws and has missed 8 free throws. Which simulation can be used to find the probability of Andre missing the next free throw?

**A.** A bag of 6 marbles, with 3 marbles representing the made free throws and 3 marbles representing the missed free throws.

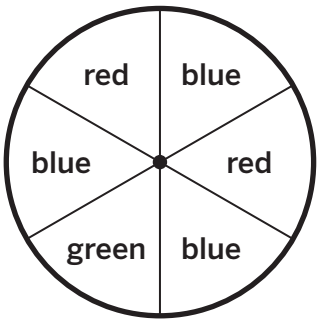
**B.** A number cube with 1 and 2 representing the made free throws and 4, 5, and 6 representing the missed free throws.

**C.** A coin with heads representing the made free throws and tails representing the missed free throws.

**D.** A spinner divided into 3 equal-sized parts, with two parts representing the made free throws and one part representing the missed free throws.

Name: ..... Date: ..... Period: .....

**4.** A spinner is divided into 6 equal-sized sections. What is the probability that the spinner will *not* land on red on the first spin and *will* land on red on the second spin?




A. $\frac{1}{8}$

B. $\frac{2}{9}$

C. $\frac{2}{3}$

D. $1$

**Shawn rolled 2 number cubes 50 times and recorded the results in the table shown. Refer to the table for Problems 5–7.**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3, 1 | 4, 6 | 1, 6 | 1, 3 | 4, 4 | 6, 1 | 1, 6 | 4, 3 | 4, 5 | 5, 2 |
| 3, 5 | 1, 2 | 6, 1 | 5, 3 | 1, 4 | 5, 1 | 6, 5 | 3, 4 | 6, 6 | 3, 4 |
| 4, 3 | 5, 4 | 4, 2 | 6, 1 | 6, 4 | 4, 3 | 2, 1 | 4, 5 | 6, 3 | 6, 6 |
| 5, 5 | 1, 3 | 1, 5 | 4, 4 | 2, 1 | 2, 3 | 5, 6 | 4, 4 | 4, 4 | 6, 5 |
| 6, 4 | 4, 1 | 6, 2 | 3, 2 | 3, 5 | 2, 3 | 3, 4 | 1, 4 | 5, 1 | 2, 2 |

**5.** Based on this simulation, determine the probability of:

**a** Rolling doubles.

**b** Rolling an even number and an odd number (in any order).

**c** Rolling two even numbers.

**6.** The theoretical probability of rolling two odd numbers is $\frac{1}{4}$. Is the experimental probability greater or less than the theoretical probability? Explain your thinking.

**7.** The theoretical probability of rolling a sum of 7 is $\frac{1}{6}$. Is the experimental probability greater or less than the theoretical probability? Explain your thinking.