

Course 2 Unit 3 Practice

LESSON 8-1

- There are 11 player positions on a high school soccer team. One coach uses these positions: 1 goalie, 4 midfielders, 1 center, 3 defenders and 2 forwards. Write a ratio in simplest form to express each relationship.
 - goalie to all players
 - midfielders to forwards
 - center to defenders
 - midfielders to all players
 - players who are not defenders to all players
- What is the unit rate for 5 pounds of lunch meat for \$42.50?
 - \$5.31 per pound
 - \$6.50 per pound
 - \$7.25 per pound
 - \$8.50 per pound
- Which pair of ratios are equivalent?
 - $\frac{9}{5}, \frac{27}{10}$
 - $\frac{0.5}{8}, \frac{2}{32}$
 - $\frac{6}{4}, \frac{30}{24}$
 - $\frac{1.2}{6.1}, \frac{3.6}{12.4}$

- Reason quantitatively.** Kendall was able to score 368 points in 32 games. Create a unit rate for this information.
- Make sense of problems.** There are 950 students at Hanover High School. The ratio of the number of freshmen to all students is 3:10. The ratio of the number of sophomores to all students is 1:2. What is the ratio of the number of freshmen to sophomores?

LESSON 8-2

- Use cross products to determine which pair of ratios are equivalent.
 - $\frac{2}{3}$ and $\frac{5}{6}$
 - $\frac{2}{5}$ and $\frac{4}{8}$
 - $\frac{3}{4}$ and $\frac{6}{8}$
 - $\frac{5}{9}$ and $\frac{15}{6}$
- Solve each proportion.
 - $\frac{n}{2} = \frac{8.5}{0.25}$
 - $\frac{4}{n} = \frac{3.2}{8.4}$
 - $\frac{2}{n} = \frac{2}{15.4}$

8. Look for and make use of structure. Write a proportion for each situation. Then solve.

a. One recipe for banana bread says to use $\frac{3}{4}$ cup of honey to make 2 banana breads. How much honey is needed to make 7 banana breads?

b. The ratio of boys to girls on a swimming team is 3 to 4. The team has 70 members. How many are boys?

c. Joseph had 380 heartbeats in 4 minutes. How many heartbeats does he have in 15 minutes?

9. Model with mathematics. A package of tickets for 10 rides at the carnival costs \$8. What proportion can you write to find what 35 rides at the carnival will cost if all tickets cost the same amount?

10. If $\frac{1}{2}$ cup of white sugar is needed for one batch of oatmeal raisin cookies, how much white sugar is needed for 7 batches of cookies?

- A. 2.5 cups
- B. 3.5 cups
- C. 7 cups
- D. 14 cups

LESSON 8-3

11. Use appropriate tools strategically. Convert, rounding your answers to the nearest tenth when necessary.

a. 9 in. \approx ____ cm

b. ____ mi \approx 40 km

c. 20 cm \approx ____ in.

d. ____ L \approx 60 qt.

12. 54 pounds is approximately how many kilograms? Remember that 1 pound is about 0.4536 kg.

- A. 18.6 kg
- B. 24.5 kg
- C. 88.4 kg
- D. 119.0 kg

13. Make sense of problems. A tennis ball weighs about 56.7 grams. About how many ounces would a dozen tennis balls weigh?

14. The Appalachian Trail is roughly 2,180 miles long. About how long is the trail in kilometers?

15. Kevin can run a mile in 7 minutes. Which is the most reasonable time for him to run a 10-km race?
- A. 20 minutes
 - B. 43 minutes
 - C. 52 minutes
 - D. 61 minutes

LESSON 9-1

16. **Construct viable arguments.** Solve the proportion $\frac{4}{9} = \frac{28}{x}$ using two different methods. Explain each method.

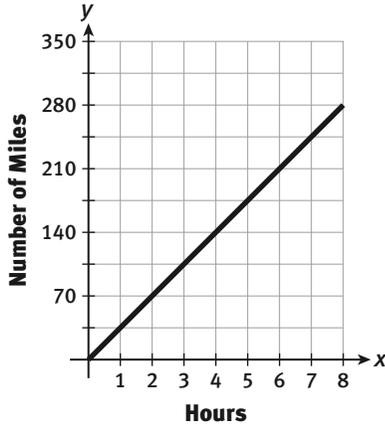
17. Determine if the given ratios are proportional. Explain.
- a. 50 to 32 and 10 to 8

 - b. 3.5:6.25 and 14:25

18. Solve the proportion. $\frac{7.7}{15.4} = \frac{y}{2.2}$
- A. 0.1
 - B. 1.1
 - C. 5.3
 - D. 7

19. The ratio of the gallons of paint needed to the area covered in square feet is 3 to 1275. Use a proportion to predict how much area can be covered with 7 gallons of paint.
- A. 2775
 - B. 2975
 - C. 3225
 - D. 3825

- 20. Reason quantitatively.** Use the following graph to make predictions.



- Use the graph to predict the number of miles driven in 10 hours.
- Use the graph to predict the number of hours it would take to drive 180 miles.
- What does the point $(0, 0)$ mean in this situation?
- What does the point $(1, 35)$ mean in this situation?
- Write an equation in the form $y = kx$ to represent this situation.

LESSON 9-2

- 21. Model with mathematics.** At a local pool club they advocate having 1 lifeguard for every 50 people.
- What is the constant of proportionality?
 - Define variables and write an equation to represent this relationship.
 - Create a table of this information.
 - Represent this information in a graph.
 - How many people are at the pool if there are 7 lifeguards?
- 22.** Alonzo types 45 words per minute. What equation can be used to show this relationship?
- | | |
|------------------------------|------------------------|
| A. $y = 45 + x$ | B. $y = 45x$ |
| C. $y = \frac{45}{x}$ | D. $y = 45 - x$ |
- 23. Reason quantitatively.** It takes Martin 1 hour to drive 65 miles, 2 hours to drive 130 miles and 3 hours to drive 195 miles. Is this a proportional relationship? Define variables and write an equation to represent the relationship.

24. The table below shows how many gallons of gasoline are purchased and the price. Which equation represents the situation?

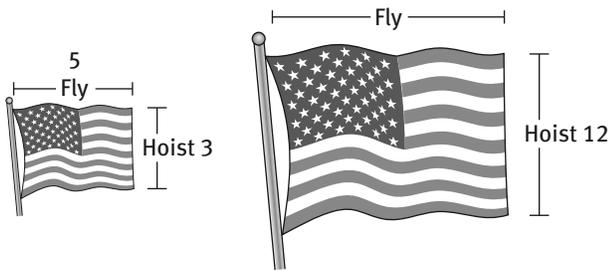
Gallons of Gas	3	4	5	6	7
Total Cost (\$)	10.05	13.40	16.75	20.10	23.45

- A. $y = 3.25x$
 B. $y = 3.35x$
 C. $y = 10.05x$
 D. $y = 13.45x$
25. Mannie bikes at a rate of 12 miles per hour when racing.
- What is the constant of proportionality?
 - Define variables and write an equation to represent this relationship.
 - Create a table of this information.
 - Represent this information in a graph.
 - How far has Mannie biked if he has been biking for 7 hours?

LESSON 10-1

26. Write an equation for the following proportional relationships.
- $\frac{1}{3.5}$
 - $\frac{7}{28}$
 - $\frac{5}{27.5}$
27. What is the constant of proportionality for a ratio of 5 to 8?
- $\frac{5}{8}$
 - $\frac{5}{13}$
 - $\frac{8}{5}$
 - $\frac{8}{15}$
28. **Make sense of problems.** The ratio of the hoist (width) to the fly (length) of an American flag is $\frac{\text{hoist}}{\text{fly}} = \frac{1}{1.9}$.
- Using this ratio, determine the fly of a flag that has a hoist of 5 feet.
 - If the ratio is changed to 3:5, determine the fly of a flag that has a hoist of 6.5 feet. Round to the nearest hundredth.

29. Determine the length of the unknown fly in the figure below. The flags have the same hoist: fly ratio.



- A. 9 feet
 B. 10 feet
 C. 18 feet
 D. 20 feet
30. **Model with mathematics.** Determine the constant of proportionality for the following:
- a. a ratio of 7 to 4
- b. the point (6, 9) on a graph
- c. four yellow to five green
- d. $9 = 5y$

LESSON 10-2

31. If the scale on a map is $\frac{\text{inches}}{\text{miles}} = \frac{1}{20}$, find the actual distances.
- a. 3 inches
- b. $\frac{3}{4}$ inch
- c. 4.5 inches
32. Two towns on a map are $3\frac{1}{4}$ inches apart. The actual distance between the towns is 104 miles. Which of the following could be the scale on the map?
- A. 1 inch : 15 miles
 B. 1 inch : 28 miles
 C. 1 inch : 32 miles
 D. 1 inch : 38 miles
33. If the scale on a map is $\frac{\text{inches}}{\text{feet}} = \frac{3}{15}$, how would the following lengths be represented?
- a. 30 feet
- b. 75 feet
- c. 15 feet

- 34. Make sense of problems.** A scale drawing of your classroom is 4 inches by 6 inches. If one inch represents 8 feet, what is the actual size of your classroom?
- A. 12 feet by 14 feet
B. 32 feet by 48 feet
C. 32 feet by 56 feet
D. 48 feet by 60 feet
- 35. Reason quantitatively.** The distance from New York to Chicago is about 700 miles.
- a. If this represents $9\frac{1}{3}$ inches on the map, what is the scale used?
- b. Calculate the number of inches on the map if the scale is $\frac{\text{inches}}{\text{miles}} = \frac{1}{50}$.
- c. What is the difference in miles traveled over 6 inches using the scales in parts a and b?
- 37.** A document is 24 inches by 36 inches. What are the dimensions of the document using the following scales?
- a. $\frac{1}{4}$
b. $\frac{1}{2}$
c. $\frac{3}{4}$
d. $1\frac{1}{2}$
- 38. Reason quantitatively.** A copy of a document that was originally 36 inches by 48 inches is now 12 inches by 16 inches. What scale was used for the reduction?
- 39. Attend to precision.** A train model has " $\frac{1}{64}$ scale" printed on the outside of the box. If the actual train is 78 feet long, what is the length of the model in inches?
- A. 1.23 inches
B. 12.125 inches
C. 14.625 inches
D. 18.375 inches
- 40.** A document that is 14 inches by 18 inches is redrawn at $1\frac{1}{2}$ scale and redrawn again at $\frac{1}{2}$ scale. What are the final dimensions?

LESSON 10-3

- 36.** The length of a car measures 20 feet. What is the length of a model car if the scale factor is 1:64 inches?
- A. 1.67 inches
B. 3.21 inches
C. 3.75 inches
D. 4.25 inches

LESSON 11-1**41.** Solve.

- a. What percent is 72 of 120?

- b. 40 is 8% of what number?

- c. 35% of 280 is what number?

- d. What number is 25% of 300?

- e. 34 is what percent of 60?

42. Attend to precision. There are 750 people at a football game. Out of this number, 320 are students. What percent of the people at the football game are not students? Round to the nearest hundredth, if needed.

- 43.** In a group of 120 seventh graders, 30% have completed their science project. How many students have completed their science project?
- A. 24
 - B. 36
 - C. 48
 - D. 360

44. Carl spent 12.5% of the money in his pocket on dinner. His dinner cost \$15.25. How much did he have in his pocket?

- A. \$102.00
- B. \$122.00
- C. \$172.36
- D. \$190.63

45. Reason quantitatively. In a bag of marbles, 12% were blue, 18% were green, and the rest were purple. If the bag has 150 marbles, how many were blue or green?

LESSON 11-2

46. A real estate agent earns a commission when they sell a home. The commission is 5%. If the agent sells a \$350,000 house, what is the commission?

- A. \$12,500
- B. \$17,500
- C. \$19,200
- D. \$70,200

47. Persevere in solving problems. A salesperson at a car dealership has a salary of \$900 per week plus a 3% commission on sales. If a salesperson had sales of \$72,000 in one week, what was the salesperson paid that week?

48. Carissa leaves a 20% tip at her favorite restaurant. Her bill is \$32.18. What tip should she leave?
49. The sales tax on a sofa that cost \$575 was \$43.13. What was the percent sales tax?
50. **Make sense of problems.** If a new surfboard in North Carolina costs \$320 and the sales tax is 4.75%, what was the total cost of the surfboard?
- A. \$304.80
 - B. \$321.25
 - C. \$335.20
 - D. \$342.40
51. **Persevere in solving problems.** The regular price of Colby cheese is \$3.99 per pound. The sale price is \$2.89 per pound.
- a. What is the difference in price?
 - b. What is the percent of change to the nearest whole percent?
 - c. Is this a percent increase or decrease?
52. The monthly snowfall on Sugar Mountain dropped from 26 inches to 20 inches. What is the percent decrease?
- A. 3.3%
 - B. 23.1%
 - C. 30%
 - D. 76.9%
53. The Okontas previously lived in a house that had 2150 square feet of space. The square footage of their new home is 2975 square feet. What is the percent of increase of their living space?
- A. 17.3%
 - B. 36.1%
 - C. 38.4%
 - D. 82.5%
54. When Mohammed was born, he was 21 inches long. At his last check up, he was 54 inches tall. What is the percent increase in his growth to the nearest percent?
55. **Reason quantitatively.** A jewelry company purchases a necklace for \$24. If they mark it up 50% to sell it at their store, what is the selling price of the necklace?

LESSON 12-1

51. **Persevere in solving problems.** The regular price of Colby cheese is \$3.99 per pound. The sale price is \$2.89 per pound.
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55. **Reason quantitatively.** A jewelry company purchases a necklace for \$24. If they mark it up 50% to sell it at their store, what is the selling price of the necklace?

LESSON 12-2

56. A lamp is on sale for 10% off the regular price of \$159. What is the sale price of the lamp?
- A. \$143.10
 - B. \$145.90
 - C. \$147.50
 - D. \$149.00
57. A baker can make a cupcake for \$2.30. She would like to make a profit of 50 cents on each cupcake. What is the percent markup on the cupcake, to the nearest tenth of a percent?
58. A recliner that is normally \$750 is discounted to \$600. What is the percent discount?
- A. 10%
 - B. 20%
 - C. 25%
 - D. 30%
59. **Make sense of problems.** A box of granola bars that costs \$4.00 is on sale for “buy 2, get 1 free.” What is the true percent of discount on the box of granola bars to the nearest tenth of a percent?
60. **Reason quantitatively.** Celine has two coupons. One is for \$5 off a purchase and the other is for 20% off a purchase. At what purchase price will the coupons have the same value?

LESSON 12-3

61. Mr. Adeb takes out an \$8,000 personal loan to restore his antique car. The bank loans him the money at 4.5% simple interest for 4 years.
- a. How much will Mr. Adeb pay in interest?
 - b. What is the total cost of the restoration including the interest?
62. A \$3,000 loan is taken out for 12% interest for 6 months. What is the amount of interest charged?
- A. \$36.00
 - B. \$90.00
 - C. \$180.00
 - D. \$270.00
63. **Attend to precision.** Mr. and Mrs. Watson decide to remodel their bathroom. They need a short term loan. They borrow \$3,200 from a local bank at an interest rate of 11%. After receiving their income tax return, they are able to pay off the loan after only 9 months. How much interest did they pay on the loan?
64. A house costs \$150,000. If a loan is taken out for 15 years and the interest paid is \$101,250, what is the interest rate on the loan?
- A. 4.5%
 - B. 5.25%
 - C. 5.75%
 - D. 6.5%

65. Make sense of problems. Delia takes out a used car loan for \$18,000 at an interest rate of 6.5%. The amount of interest to be paid is \$4680. How many months is the loan for?

68. Attend to precision. A clinic estimates the number of patients expected each week. The actual number of patients in a week was 320. The percent error in the estimation was 15%. If the estimation is on the high side, how many patients were expected to be seen?

LESSON 12-4

66. A surveyor measured the distance across a pond as 428 feet. The actual measurement was 409 feet.

- What is the difference in measurements?
- To find the percent of error, do you divide by the estimate or actual value?
- What is the percent error to the nearest tenth?

67. Milford measures the weight of a mineral as 6.2 grams. The actual weight of the mineral is 5.9 grams. What is Milford's percent error?

- 4.8%
- 5.1%
- 5.4%
- 5.8%

69. Reagan had budgeted \$1,200 for her vacation. The actual cost of her vacation was \$1,495. What was her percent error?

- 19.7%
- 21.3%
- 24.6%
- 29.5%

70. Make sense of problems. Martha purchased a new swing set. She thought she could buy the swing set for \$1,475, but it was on clearance for 10% off the original price of \$1,495. What is the percent of error between her estimate and the actual cost, to the nearest tenth?