1) A pair of shoes were on sale for 25% off. The shoes now cost $48. What was the original price of the shoes?

25% discount, so you paid 75% of the price. Since the original is unknown, it is 75% of what number is 48?

48 = (.75)(x)   or $\dfrac{48}{X} = \dfrac{75}{100}$ x= $64

2) Marina bought a $150 pair of sneakers, but her total was $162.48. What percent sales tax did she pay?

First find the tax!   162.48 - 150 = 12.48

Now, what percent of 150 is 12.48?   12.48 = (x)(150)   x = 8.32 %

Lesson 5-1 Ratios (pp. 184–188)

Express each ratio as a fraction in simplest form.

1. 10 girls out of 24 students $\frac{5}{12}$

2. 6 red cars to 4 blue cars $\frac{3}{2}$

3. 10 yards to 8 inches $\frac{45}{1}$

4. 18 ounces to 3 cups $\frac{3}{4}$

5. Jean got 12 hits out of 16 times at bat. Express this rate as a fraction in simplest form. Explain its meaning.

Lesson 5-2 Unit Rates (pp. 189–193)

Express each rate as a unit rate. Round to the nearest tenth or to the nearest cent, if necessary.

6. $25.97 for 8 boxes **$3.25 per box**

7. 400 meters in 5 minutes **80 meters per minute**

8. $175 for 4 concert tickets **$43.75 per ticket**

9. 125 miles in 200 minutes **0.6 mile per minute**

10. **Financial Literacy** An eight pack of juice boxes costs $4.79, and a twelve pack of juice boxes costs $6.59. Which is a better buy? Explain. **See margin.**

$$125 \div 200$$

$$0.625$$

$$\downarrow$$

$$0.6 \text{ (tenth)}$$

$$\frac{4.79}{8} = 0.59875$$

$$\frac{6.59}{12} = 0.5491\overline{6}$$

Better!

Lesson 5-3 Complex Fractions and Unit Rates (pp.

Simplify.

11. $\dfrac{\frac{6}{2}}{5}$ **15**

12. $\dfrac{\frac{5}{3}}{10}$ $\dfrac{1}{6}$

13. Noreen can walk $1\frac{1}{10}$ miles in $\frac{1}{3}$ hour. Find her average speed in miles per hour. $3\dfrac{3}{10}$ **mph**

14. Write $66\frac{2}{3}\%$ as a fraction in simplest form. $\dfrac{2}{3}$

15. Write $6\frac{1}{2}\%$ as a fraction in simplest form. $\dfrac{13}{200}$

16. Write $11\frac{1}{3}\%$ as a fraction in simplest form. $\dfrac{17}{150}$

Lesson 5-4 Converting Rates (pp. 200–205)

Complete each conversion. Round to the nearest hundredth, if necessary.

17. 7 in. ≈ ■ cm **17.78**   **18.** 20 m ≈ ■ yd **21.88**

19. 25 fl oz ≈ ■ mL   **20.** 4 L ≈ ■ gal **1.06**
739.35

21. 18 pt ≈ ■ L **8.51**   **22.** 12 oz ≈ ■ g **340.2**

23. 26 cm ≈ ■ in. **10.24**   **24.** 3 qt ≈ ■ L **2.84**

25. 4 m ≈ ■ ft **13.12**   **26.** 68 g ≈ ■ oz **2.38**

27. **STEM** A plane is flying at a speed of 425 miles per hour. How far will the plane travel in 0.75 hour? **318.75 mi**

28. A swimming pool is being drained at a rate of 50 gallons per hour. How many milliliters per second is this? Round to the nearest tenth. **52.6 mL/s**

29. A runner runs 2 miles in 9.56 minutes. How many meters per second is this? **5.61 m/s**

30. A family drives their car 135 miles in 3 hours. How many kilometers per hour is this? **72.41 km/h**

Lesson 5-5 Proportional and Nonproportional Rela

Determine whether the cost is proportional to the number of books purchased. If the relationship is proportional, find the constant of proportionality. Explain your reasoning.

31.

Books	1	2	3	4
Cost ($)	8	16	24	32

Yes; 8; each rate is equal to 8.

32.

Books	2	4	6	8
Cost ($)	2	5	7	10

No; the rates are not equal.

33. A customer at the ring toss booth gets 8 rings for $2. Find the constant of proportionality. Write an equation relating the cost to the number of rings. At this same rate, how much would a customer pay for 11 rings? for 20 rings?
0.25; $c = 0.25r$, 11 rings cost $2.75; 20 rings cost $5

34. Mrs. Tebon buys 25 party favors for $5. At this same rate, how much would she pay for 40 party favors? for 60 party favors? **$8.00; $12.00**

Lesson 5-7 Solving Proportions (pp. 218–223)

Solve each proportion.

38. $\frac{15}{a} = \frac{5}{4}$ **12**

39. $\frac{m}{6} = \frac{18}{15}$ **7.2**

40. $\frac{28}{24} = \frac{d}{12}$ **14**

41. $\frac{16.5}{21} = \frac{5.5}{t}$ **7**

42. Financial Literacy A homeowner whose house is assessed for $120,000 pays $1800 in taxes. At the same rate, what is the tax on a house assessed at $135,000? **$2025**

## Lesson 5-8 Scale Drawing and Models (pp. 224–229)

On the scale drawing of a museum, the scale is 0.5 inch = 10 feet. Find the actual length of each gallery.

	Gallery	Drawing Length	
43.	Modern Art	6 in.	**120 ft**
44.	Renaissance	4.25 in.	**85 ft**
45.	Egypt	7.5 in.	**150 ft**

46. The length of a highway is 900 miles. If 0.5 inch on a map represents 50 miles, what is the length of the highway on the map? **9 in.**

Lesson 5-9 Similar Figures (pp. 232–237)

The figures are similar. Determine each missing measure.

47.   **7.2 in.**

**48.**   **8 cm**
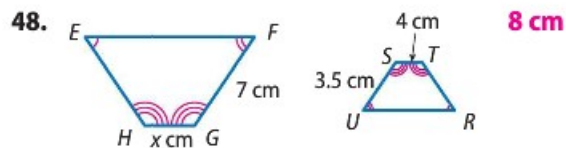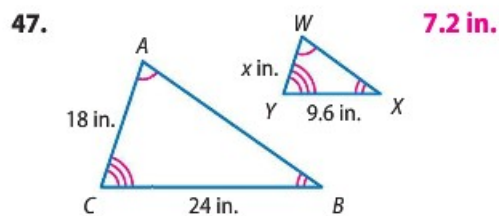
49. A mosaic is created using rectangular blocks. Block A has a length of 5 centimeters and a width of 2.5 centimeters. Block B is similar to block A and has a length of 7 centimeters. What is the width of block B? **3.5 cm**

50. Keshawn enlarges a rectangular photograph to make a poster that is similar to the photograph. The photograph is 4 inches wide and 6 inches long. The poster is 51 inches long. What is the width of the poster? **34 in.**

Lesson 5-10 Indirect Measurement (pp. 238–242)

51. At 7 feet 8 inches, the world's tallest woman casts a 46-inch shadow. At the same time, the world's shortest woman casts a 15.5-inch shadow. How tall is the world's shortest woman? **31 in.**

52. The largest known pyramid is the Pyramid of Khufu. At a certain time of day, a vertical yard stick casts a shadow 1.5 feet long, and the pyramid casts a shadow 241 feet long. How tall is the pyramid? **482 ft**

53. Mylie's house is 9 meters tall and casts a shadow 1.5 meters long. At the same time of day, a nearby doghouse casts a shadow that is 0.2 meter long. How tall is the dog house? **1.2 m**

54. In the figure below, $\triangle ABE \approx \triangle ACD$. What is the distance across the pond? **70 m**
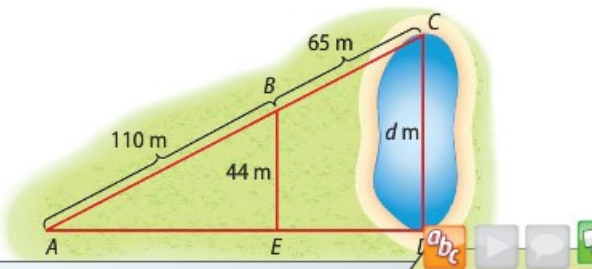
1. 12 is what percent of 60? **20%**

2. What is 63% of 130? **81.9**

3. 28 is 80% of what number? **35**

4. 8 hours is what percent of 24 hours? **33.$\overline{3}$%**

5. What distance is 72% of 120 miles? **86.4 mi**

6. 36 pounds is 15% of what weight? **240 lb**

7. Thirty percent of the CDs that Monique owns are classical. If Monique owns 120 CDs, how many are classical? **36 CDs**

8. At Marie's school, 65% of the students are learning a second language. There are 143 students learning a second language. How many students are in Marie's school? **220 students**

9. In a dance class, 70% of the students wear black ballet shoes. There are 30 students that wear black shoes. How many students are in the class? **43 students**

Find the percent of each number mentally.

10. 50% of 36 **18**

11. 40% of 55 **22**

12. $33\frac{1}{3}$% of 27 **9**

13. 1% of 167 **1.67**

Estimate. 14–18. See margin.

14. 24% of 40 *10*

15. 62% of 90 *54*

16. $\frac{1}{6}$% of 298 *0.5*

17. 130% of 250 *325*

18. Tito had 244 free throw attempts in his high school career. If he was successful 77% of the time, about how many free throws did he make? *188*

19. There are 38 students in Mr. Raymond's science class. If 76% of them get an *A* on the final exam, about how many students got *A*'s? **about 29**

$$\frac{36}{X} = \frac{15}{100} \; \textcircled{6}$$

Solve each problem using a percent equation.

20. 17 is what percent of 68? **25%**

21. What is $16\frac{2}{3}$% of 24? **4**

22. 55 is 20% of what number? **275**

23. 48 is what percent of 32? **150%**

24. 24 is what percent of 48? **50%**

25. 49 is what percent of 140? **35%**

26. What is 75% of 200? **150**

27. What is 30% of 90? **27**

28. The items in a souvenir shop are on sale for the prices shown. What percent of the original price is the sale price for each item?
    hat: 75%, towel: 80%, bag: 70%

Item	Original Price	Sale Price
hat	$14.00	$10.50
beach towel	$17.50	$14.00
tote bag	$9.00	$6.30

29. **No; the jersey is now 75% off the original price. If the jersey was $100, it is $50 after the first markdown. After the manager takes 50% off of $50, the jersey is $25, or 75% off the original price.**

29. A jersey is on sale for 50% off the original price. A week later, the manager takes another 50% off. Is the jersey now free? Explain.

$$\textcircled{16} \; 1\% \text{ of } 300 = 3$$
$$\frac{1}{6}\% = \frac{3}{6} = 0.5$$

$$\textcircled{18} \; \frac{77}{100} = \frac{X}{244}$$
$$X = 188$$

$$\frac{1}{2} = 50\%$$
$$\frac{1}{3} = 33\frac{1}{3}\%$$
$$\frac{1}{4} = 25\%$$

Find the percent of change. Round to the nearest tenth, if necessary. Then state whether the percent of change is an *increase* or a *decrease*.

30. From 55 lb to 24 lb   **−56.4%; decrease**

31. From $55.75 to $75.00   **34.5%; increase**

Find the percent error.

32. actual distance: 3.2 m, estimated distance: 3.4 m   **6.25%**

33. estimated time: 50 min, actual time: 90 min   **44.4̄%**

34. The number of pints of mint chocolate chip sold last week was 88. If this week 110 pints are sold, what is the percent of increase?   **25%**

35. A project estimated to take 30 days was completed in 75 days. What was the percent error of the estimate?   **60%**

Find the selling price for each item given the cost and the percent of markup or discount.

36. tennis shoes: $85; 24% discount   **$64.60**

37. portable MP3 player: $150; 36% markup   **$204**

38. pants: $75; 85% discount   **$11.25**

39. amplifier: $100; 135% markup   **$235**

40. A surfboard has an original price of $259. It is on sale for 55% off the original price. Find the sale price of the surfboard.   **$116.55**

41. A jacket with an original price of $49.95 is discounted 33%. Sales tax of 7% is added to the discounted price. How much does it cost to purchase the jacket?   **$35.81**

42. A laptop case has an original price of $45. Ellen has a coupon for 35% off the original price. Find how much Ellen paid for the laptop case.   **$29.25**

43. Nathan bought a bicycle for $230 at an auction. He fixed it up and sold it at a 30% markup. How much did Nathan sell the bike for?   **$299**

44. Nan bought an $85 dress on sale at 25% off the original price. She paid 5% sales tax on the sale. What was her total bill?   **$66.94**

Find the simple interest to the nearest cent.

45. $575 at 6.25% for 7 years   **$251.56**

46. $12,750 at 5% for 10 years   **$6375.00**

$$32)\quad \frac{0.2}{3.2} = 0.0625$$
$$6.25\%$$

$$46)\ I = prt$$
$$12750(0.05)(10)$$
$$\text{Final Balance}$$
$$12750 + 6375 = \$19{,}125$$