



Lesson Check

Do you know HOW?

Solve each proportion.

1. $\frac{b}{6} = \frac{4}{5}$

2. $\frac{5}{9} = \frac{15}{x}$

3. $\frac{w+3}{4} = \frac{w}{2}$

4. $\frac{3}{x+1} = \frac{1}{2}$

5. **Music** A band went to a recording studio and recorded 4 songs in 3 h. How long would it take the band to record 9 songs if they record at the same rate?

Do you UNDERSTAND? MATHEMATICAL PRACTICES

- Vocabulary** Use the proportion $\frac{m}{n} = \frac{p}{q}$. Identify the following.

- 6. the extremes
- 7. the means
- 8. the cross products

- 9. Reasoning** When solving $\frac{x}{5} = \frac{3}{4}$, Lisa's first step was to write $4x = 5(3)$. Jen's first step was to write $20\left(\frac{x}{5}\right) = 20\left(\frac{3}{4}\right)$. Will both methods work? Explain.



Practice and Problem-Solving Exercises MATHEMATICAL PRACTICES

A Practice

Solve each proportion using the Multiplication Property of Equality.

10. $\frac{q}{8} = \frac{4}{5}$

11. $\frac{-3}{4} = \frac{x}{26}$

12. $\frac{3}{4} = \frac{x}{5}$

13. $\frac{m}{7} = \frac{3}{5}$

14. $\frac{3}{16} = \frac{x}{12}$

15. $\frac{9}{2} = \frac{k}{25}$

16. $\frac{x}{120} = \frac{1}{24}$

17. $\frac{2}{15} = \frac{h}{125}$

Solve each proportion using the Cross Products Property.

18. $\frac{3}{v} = \frac{8}{13}$

19. $\frac{15}{a} = \frac{3}{2}$

20. $\frac{3}{8} = \frac{30}{m}$

21. $\frac{2}{7} = \frac{4}{d}$

22. $\frac{-9}{b} = \frac{5}{6}$

23. $\frac{8}{p} = \frac{3}{10}$

24. $\frac{-3}{4} = \frac{m}{22}$

25. $\frac{2}{-5} = \frac{6}{t}$

Solve each proportion using any method.

26. $\frac{a-2}{9} = \frac{2}{3}$

27. $\frac{b+4}{5} = \frac{7}{4}$

28. $\frac{3}{7} = \frac{c+4}{35}$

29. $\frac{2c}{11} = \frac{c-3}{4}$

30. $\frac{7}{k-2} = \frac{5}{8}$

31. $\frac{3}{3b+4} = \frac{2}{b-4}$

32. $\frac{q+2}{5} = \frac{2q-11}{7}$

33. $\frac{c+1}{c-2} = \frac{4}{7}$

34. **Gardening** A gardener is transplanting flowers into a flowerbed. She has been working for an hour and has transplanted 14 flowers. She has 35 more flowers to transplant. If she works at the same rate, how many more hours will it take her?

35. **Florists** A florist is making centerpieces. He uses 2 dozen roses for every 5 centerpieces. How many dozens of roses will he need to make 20 centerpieces?

36. **Picnics** If 5 lb of pasta salad serves 14 people, how much pasta salad should you bring to a picnic with 49 people?

See Problem 1.

See Problem 2.

See Problem 3.

See Problem 4.

B Apply

37. **Statistics** Approximately 3 people out of every 30 are left-handed. About how many left-handed people would you expect in a group of 140 people?
38. **Think About a Plan** Maya runs 100 m in 13.4 s. Amy can run 100 m in 14.1 s. If Amy were to finish a 100-m race at the same time as Maya, how much of a head start, in meters, would Amy need?
 - What information do you know? What information is unknown?
 - What proportion can you write that will help you solve the problem?
39. **Electricity** The electric bill for Ferguson's Furniture is shown at the right. The cost of electricity per kilowatt-hour and the total charges for one month are given. How many kilowatt-hours of electricity did Ferguson's Furniture use in that month?
40. **Video Downloads** A particular computer takes 15 min to download a 45-min TV show. How long will it take the computer to download a 2-h movie?
41. **Schedules** You want to meet your friend at a park 4 mi away from your house. You are going to bike to the park at an average rate of 10 mi/h. Your friend lives 1.2 mi away from the park and walks at an average rate of 3 mi/h. How many minutes ahead of you should your friend start out so that you meet at the park at the same time?

Centerville Electric	
Account Name: Ferguson's Furniture	
Account Number: 34-14567-89	
Cost per kilowatt-hour	\$0.07
Total charges	\$143.32
Previous balance	\$0.00
Total Amount Due	\$143.32

Solve each proportion. Tell whether you used the Multiplication Property of Equality or the Cross Products Property for your first step. Explain your choice.

42. $\frac{p}{4} = \frac{7}{8}$

43. $\frac{m}{4.5} = \frac{2}{5}$

44. $\frac{3}{10} = \frac{b}{7}$

45. $\frac{r}{2.1} = \frac{3.6}{2.8}$

46. $\frac{9}{14} = \frac{3}{n}$

47. $\frac{1.5}{y} = \frac{2.5}{7}$

48. $\frac{b+13}{2} = \frac{-5b}{3}$

49. $\frac{3b}{b-4} = \frac{3}{7}$

50. $\frac{x+2}{2x-6} = \frac{3}{8}$

51. **Error Analysis** Describe and correct the error in solving the proportion at the right.

52. **Bakery** A bakery sells packages of 10 bagels for \$3.69. If the bakery starts selling the bagels in packages of 12, how much would you expect a package of 12 to cost?

(A) \$3.08

(C) \$4.43

(B) \$4.32

(D) \$4.69

53. **Open-Ended** Write a proportion that contains a variable. Name the extremes, the means, and the cross products. Solve the proportion. Tell whether you used the Multiplication Property of Equality or the Cross Products Property to solve the proportion. Explain your choice.

- STEM** 54. **Biology** Many trees have concentric rings that can be counted to determine the tree's age. Each ring represents one year's growth. A maple tree with a diameter of 12 in. has 32 rings. If the tree continues to grow at about the same rate, how many rings will the tree have when its diameter is 20 in.?

$$\begin{aligned} \frac{8}{3} &= \frac{x+3}{2} \\ 16 &= 3x+3 \\ 13 &= 3x \\ \frac{13}{3} &= x \end{aligned}$$