CHAPTER 6

Algebra Review

EXAMPLE 1 *Writing and Simplifying Ratios*

a. Train A takes 35 minutes to travel its route. Train B, traveling the same route but making more stops, takes 47 minutes. What is the ratio of the time of Train A to Train B?

b. Jennie's height is 4 feet, 7 inches. Her younger sister's height is 25 inches. Find the ratio of Jennie's height to her sister's.

SOLUTIONS

a. 35 minutes to 47 minutes $= \frac{35 \text{ minutes}}{47 \text{ minutes}} = \frac{35}{47}$

b. Convert 4 feet, 7 inches to inches: $4(12) + 7 = 55$ inches

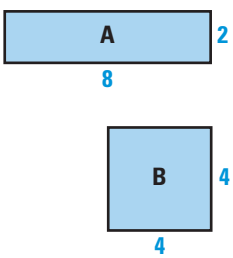
55 inches to 25 inches $= \frac{55 \text{ inches}}{25 \text{ inches}} = \frac{55}{25} = \frac{11}{5}$

EXERCISES

Write the following ratios.

1. Basmati rice needs to cook for 20 minutes, while quinoa (another grain) cooks for 25 minutes. What is the ratio of cooking times for rice to quinoa?
2. Jonathan caught 7 fish and Geogeanne caught 4. What is the ratio of fish caught of Jonathan to Geogeanne?
3. Two sunflowers' growth was measured daily. At the end of the experiment, Sunflower A had grown from 2 inches to 2 feet, 3 inches. Sunflower B had grown from 3 inches to 2 feet, 6 inches. Find the ratio of the growth in height of Sunflower A to Sunflower B.
4. A soccer team won 22 games and lost 8. What is their win-loss ratio?
5. Charlotte's essay on pigs was 824 words in length. Wilbur's essay was only 360 words long. What is the ratio of the length of Charlotte's essay to Wilbur's essay?
6. A gingham bed sheet has 220 threads per square inch while an embroidered white sheet has 180 threads per square inch. Find the ratio of threads per square inch of the gingham sheet to the white sheet.

Use the diagram at the right.



7. What is the ratio of length to width of rectangle A?
8. What is the ratio of the perimeter of rectangle A to the perimeter of rectangle B?
9. What is the ratio of the area of rectangle A to the area of rectangle B?

EXAMPLE 2 Distributive Property

Solve.

a. $4(x + 3) = 36$

$4x + 12 = 36$

$4x = 24$

$x = 6$

b. $6(x + 4) + 12 = 5(x + 3) + 7$

$6x + 24 + 12 = 5x + 15 + 7$

$6x + 36 = 5x + 22$

$x = -14$

EXERCISES

Solve.

10. $2(x + 7) = 20$

11. $8(x + 6) = 24$

12. $6(x - 2) = 24$

13. $-10(y + 8) = -40$

14. $16(3 - d) = -4$

15. $7(2 - x) = 5x$

16. $-4(x - 6) = 28$

17. $-9(5 - 3x) = 9$

18. $\frac{1}{2}(10 - 9x) = \frac{3}{2}$

19. $\frac{2}{3}(m + 4) - 8 = \frac{11}{3}$

20. $5(3a - 2) = 2(6a - 8)$

21. $3(x - 1) + 3 = 4(x - 2)$

EXAMPLE 3 Solving Proportions

Solve.

a. $\frac{x}{8} = \frac{3}{4}$

$4x = 8 \cdot 3$

$4x = 24$

$x = 6$

b. $\frac{6}{x + 4} = \frac{1}{9}$

$6 \cdot 9 = x + 4$

$54 = x + 4$

$50 = x$

EXERCISES

Solve.

22. $\frac{x}{20} = \frac{1}{5}$

23. $\frac{2}{q} = \frac{4}{18}$

24. $\frac{7}{100} = \frac{14}{y}$

25. $\frac{t}{27} = \frac{4}{9}$

26. $\frac{5}{6} = \frac{4}{r}$

27. $\frac{w}{6} = \frac{7}{17}$

28. $\frac{27}{5} = \frac{3}{z}$

29. $\frac{y}{50} = \frac{3}{100}$

30. $\frac{6}{19} = \frac{m}{95}$

31. $\frac{3}{8} = \frac{3}{2d}$

32. $\frac{6}{5m} = \frac{6}{25}$

33. $\frac{19}{x} = \frac{9}{5}$

34. $\frac{3w + 6}{28} = \frac{3}{4}$

35. $\frac{6}{45} = \frac{2z + 10}{15}$

36. $\frac{3a}{11} = \frac{54}{22}$

37. $\frac{-3}{8} = \frac{21}{2(y + 1)}$

38. $\frac{1}{18} = \frac{5}{-4(x - 1)}$

39. $\frac{3}{m + 4} = \frac{9}{14}$

40. $\frac{3}{p - 6} = \frac{1}{p}$

41. $\frac{r}{3r + 1} = \frac{2}{3}$

42. $\frac{w}{4} = \frac{9}{w}$