

Answers for 8.4

For use with pages 577–580

8.4 Skill Practice

1. reciprocal

2. When there are no common factors between the numerator and the denominator.

3. B

4. A

5. C

6. $\frac{x}{5x - 3}$

7. simplified form

8. $\frac{x - 4}{x + 1}$

9. $\frac{x - 3}{x + 5}$

10. simplified form

11. $\frac{2(x - 1)}{x - 7}$

12. $\frac{1}{x^2 + 4x + 16}$

13. $\frac{x - 6}{x + 6}$

14. $\frac{3x}{x - 2}$

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

16. simplified form

17. $\frac{x^2 - 3}{x - 3}$

18. *Sample answer:* You can only divide out common factors. The x^2 -terms are attached by addition so you cannot divide them out;

$$\begin{aligned}\frac{x^2 + 16x - 80}{x^2 - 16} &= \frac{(x - 4)(x + 20)}{(x - 4)(x + 4)} \\ &= \frac{x + 20}{x + 4}.\end{aligned}$$

19. *Sample answer:* You can only divide out common factors. Since the factors that are divided out are not common factors of the entire numerator and denominator, you cannot divide them out;

$$\begin{aligned}\frac{x^2 + 16x + 48}{x^2 + 8x + 16} &= \frac{(x + 4)(x + 12)}{(x + 4)(x + 4)} \\ &= \frac{x + 12}{x + 4}.\end{aligned}$$

20. B

21. $\frac{2}{x}$

22. $\frac{5}{2x}$

23. Exercise 21. *Sample answer:* The perimeter of Exercise 21 is smaller and the areas are the same.

24. $\frac{y^2}{3x}$

25. $\frac{8x^4}{y^2}$

26. $x^2 - 9$

27. $\frac{2(x + 1)}{x}$

28. $\frac{3(x + 6)}{2(x + 5)}$

29. $\frac{x + 4}{2(x - 5)}$

30. $\frac{2x(x + 4)}{(x + 2)(x - 3)}$

31. $(x + 2)(x + 7)$

32. $\frac{(x + 9)(x - 4)^2}{x + 7}$

33. $\frac{4(x + 5)(x + 4)}{x}$

34. $\frac{y^2}{6x^6}$

35. $\frac{4x^4y}{5z}$

Answers for 8.4 *continued*

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36. $\frac{x-2}{x+1}$

37. $\frac{16x(x-4)}{(x+4)}$

38. $\frac{x(x+3)}{2(x-5)(x+1)}$

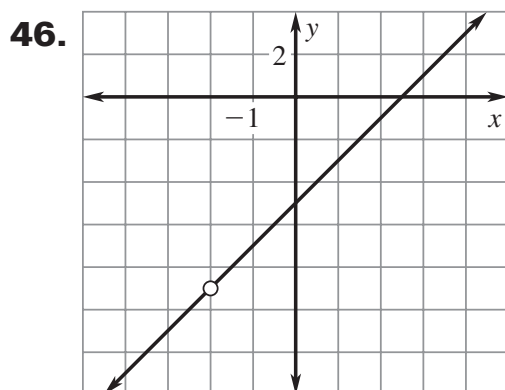
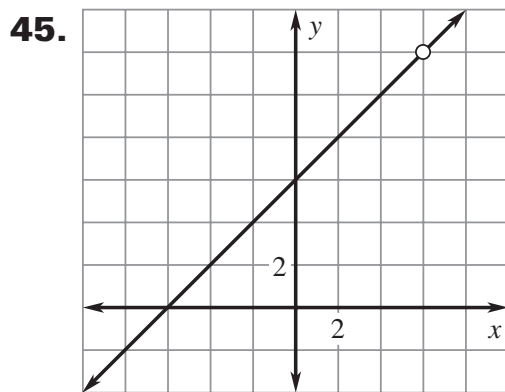
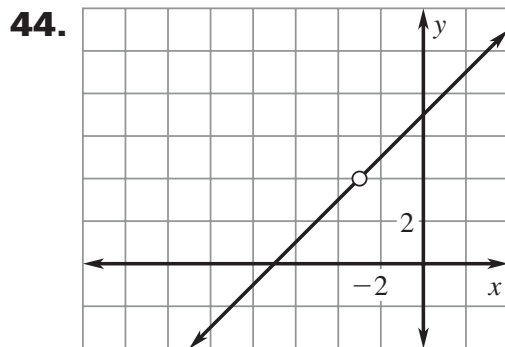
39. $\frac{x-5}{(x+5)^2}$

40. $\frac{3x+1}{4(x-2)}$

41. $\frac{5(x+1)}{x-1}$

42. $\frac{x-3}{x(x+4)^2}$

43. $\frac{(x+8)(x-7)}{6x}$



47. $\frac{4}{7x}$

8.4 Problem Solving

48. $\frac{4}{\pi}$

49. $\frac{S}{A} =$

$$\frac{(-6420t + 292,000)(5.92t^2 - 131t + 1000)}{(6.02t^2 - 125t + 1000)(-407t + 7220)}$$

\$50.21

50. a. $\frac{k_1 H^3 V^2}{k_2 H^2} = \frac{k_1 H V^2}{k^2}$

b. $V^2 = \frac{k_2}{k_1 H}$; the shorter

runner has the advantage.

Sample answer: The larger the height the smaller the fraction representing velocity.

51. a. $V_{\text{sphere}} = \frac{4}{3}\pi r^3,$

$V_{\text{cylinder}} = \pi r^2 h,$ since the

volumes are the same, set the equations equal to each other resulting in $h = \frac{4}{3}r.$

b. $SA_{\text{sphere}} = 4\pi r^2,$

$SA_{\text{cylinder}} = \frac{14}{3}\pi r^2$

c. $\frac{6}{7}$; *Sample answer:* The spherical tank uses less material.

Answers for 8.4 *continued*

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52. a. $\frac{2(r+h)}{rh}$

b. soup can: about 0.784, coffee can: about 0.382, paint can: about 0.341

c. Soup can, coffee can, paint can. *Sample answer:* The closer the efficiency is to 1, the more efficient the space is being used.

53.
$$\begin{aligned}\frac{SA}{V} &= \frac{2\pi r\ell + 4\pi r^2}{\frac{4}{3}\pi r^3 + \pi r^2\ell} \\ &= \frac{2\pi r(2r + \ell)}{\pi r^2\left(\frac{4}{3}r + \ell\right)} \\ &= \frac{2(2r + \ell)}{r\left(\frac{4}{3}r + \ell\right)} \\ &= \left(\frac{3}{3}\right) \cdot \frac{2(2r + \ell)}{r\left(\frac{4}{3}r + \ell\right)} \\ &= \frac{6(2r + \ell)}{r(4r + 3\ell)}\end{aligned}$$

8.4 Mixed Review

54. 16, 240 55. 5, 3720

56. 19, 190 57. 13, 364

58. 22, 462 59. 90, 1800

60. $x^3 + 4x^2 - 7x$

61. $x^2 + 4x - 45$

62. $x^2 + 4x - 77$

63. $x^3 - 4x^2 - 2x + 20$

64. $3x^3 - 22x^2 + 35x$

65. $x^4 + 13x^3 + 40x^2$