9.3 Exercises

1. Use a calculator to first approximate \( \frac{\sqrt{5}}{\sqrt{2}} \). On the same screen, approximate \( \sqrt{5}/2 \). Report the results on your homework paper.

2. Use a calculator to first approximate \( \frac{\sqrt{7}}{\sqrt{5}} \). On the same screen, approximate \( \sqrt{7}/5 \). Report the results on your homework paper.

3. Use a calculator to first approximate \( \frac{\sqrt{12}}{\sqrt{2}} \). On the same screen, approximate \( \sqrt{6} \). Report the results on your homework paper.

4. Use a calculator to first approximate \( \frac{\sqrt{15}}{\sqrt{5}} \). On the same screen, approximate \( \sqrt{3} \). Report the results on your homework paper.

5. Use a calculator to first approximate \( \frac{\sqrt{3}}{\sqrt{8}} \). On the same screen, approximate \( \sqrt{3}/2 \). Report the results on your homework paper.

6. Use a calculator to first approximate \( \frac{\sqrt{5}}{\sqrt{12}} \). On the same screen, approximate \( \sqrt{5}/2 \). Report the results on your homework paper.

7. Use a calculator to first approximate \( \frac{\sqrt{11}}{\sqrt{20}} \). On the same screen, approximate \( \sqrt{11}/2 \). Report the results on your homework paper.

8. Use a calculator to first approximate \( \frac{\sqrt{3}}{\sqrt{2}} \). On the same screen, approximate \( \sqrt{3} \). Report the results on your homework paper.

9. Use a calculator to first approximate \( \frac{\sqrt{11}}{\sqrt{18}} \). On the same screen, approximate \( \sqrt{11}/3 \). Report the results on your homework paper.

10. Use a calculator to first approximate \( \frac{\sqrt{7}}{\sqrt{5}} \). On the same screen, approximate \( \sqrt{7}/5 \). Report the results on your homework paper.

In Exercises 5-16, place each radical expression in simple radical form. As in Example 2 in the narrative, check your result with your calculator.

11. \( \sqrt{\frac{4}{3}} \)

12. \( \sqrt{\frac{16}{5}} \)

13. \( \sqrt{\frac{49}{12}} \)

14. \( \sqrt{\frac{81}{20}} \)

15. \( \sqrt{\frac{100}{7}} \)

16. \( \sqrt{\frac{36}{5}} \)

In Exercises 17-28, place each radical expression in simple radical form. As in Example 4 in the narrative, check your result with your calculator.

17. \( \frac{1}{\sqrt{12}} \)

18. \( \frac{1}{\sqrt{8}} \)

19. \( \frac{1}{\sqrt{20}} \)

20. \( \frac{1}{\sqrt{27}} \)

21. \( \frac{6}{\sqrt{8}} \)

22. \( \frac{4}{\sqrt{12}} \)

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In Exercises 29-36, place the given radical expression in simple form. Use prime factorization as in Example 8 in the narrative to help you with the calculations. As in Example 6, check your result with your calculator.

29. \( \frac{1}{\sqrt{96}} \)

30. \( \frac{1}{\sqrt{432}} \)

31. \( \frac{1}{\sqrt{250}} \)

32. \( \frac{1}{\sqrt{108}} \)

33. \( \sqrt{\frac{5}{96}} \)

34. \( \sqrt{\frac{2}{135}} \)

35. \( \sqrt{\frac{2}{1485}} \)

36. \( \sqrt{\frac{3}{280}} \)

In Exercises 37-44, place each of the given radical expressions in simple radical form. Make no assumptions about the sign of any variable. Variables can represent either positive or negative numbers.

37. \( \sqrt{\frac{8}{x^4}} \)

38. \( \sqrt{\frac{12}{x^6}} \)

39. \( \sqrt{\frac{20}{x^2}} \)

40. \( \sqrt{\frac{32}{x^{14}}} \)

41. \( \frac{2}{\sqrt{8x^5}} \)

42. \( \frac{3}{\sqrt{12x^6}} \)

43. \( \frac{10}{\sqrt{20x^{10}}} \)

44. \( \frac{12}{\sqrt{6x^4}} \)

In Exercises 45-48, follow the lead of Example 8 in the narrative to craft a solution.

45. Given that \( x < 0 \), place the radical expression \( 6/\sqrt{2x^6} \) in simple radical form. Check your solution on your calculator for \( x = -1 \).

46. Given that \( x > 0 \), place the radical expression \( 4/\sqrt{12x^3} \) in simple radical form. Check your solution on your calculator for \( x = 1 \).
47. Given that $x > 0$, place the radical expression $\frac{8}{\sqrt{8x^5}}$ in simple radical form. Check your solution on your calculator for $x = 1$.

48. Given that $x < 0$, place the radical expression $\frac{15}{\sqrt{20x^6}}$ in simple radical form. Check your solution on your calculator for $x = -1$.

In Exercises 49-56, place each of the radical expressions in simple form. Assume that all variables represent positive numbers.

49. $\sqrt{\frac{12}{x}}$

50. $\sqrt{\frac{18}{x}}$

51. $\sqrt{\frac{50}{x^3}}$

52. $\sqrt{\frac{72}{x^5}}$

53. $\frac{1}{\sqrt{50x}}$

54. $\frac{2}{\sqrt{18x}}$

55. $\frac{3}{\sqrt{27x^3}}$

56. $\frac{5}{\sqrt{10x^5}}$
9.3 Answers

1. \(\sqrt{5}/\sqrt{2} \approx 1.58113883\)
31. \(\sqrt{10}/50\)
33. \(\sqrt{30}/24\)
35. \(\sqrt{330}/495\)
37. \(2\sqrt{2}/x^2\)
39. \(2\sqrt{5}/|x|\)
41. \(\sqrt{2}/(2x^4)\)
43. \(\sqrt{5}/(x^4|x|)\)
45. \(-3\sqrt{2}/x^3\)
47. \(2\sqrt{2x}/x^3\)

3. \(\sqrt{10}/\sqrt{2} \approx 2.449489743\)
49. \(2\sqrt{3x}/x\)
51. \(5\sqrt{2x}/x^2\)
53. \(\sqrt{2x}/(10x)\)
55. \(\sqrt{3x}/(3x^2)\)

5. \(\sqrt{6}/4\)
7. \(\sqrt{55}/10\)
9. \(\sqrt{22}/6\)
11. \(2\sqrt{3}/3\)
13. \(7\sqrt{3}/6\)
15. \(10\sqrt{7}/7\)
17. \(\sqrt{3}/6\)
19. \(\sqrt{5}/10\)
21. \(3\sqrt{2}/2\)
23. \(\sqrt{5}/2\)
25. \(\sqrt{3}\)
27. \(3\sqrt{5}/4\)
29. \(\sqrt{6}/24\)