

# 11-3 EXERCISES

## Assignment Guide

Minimum: 1-44 e/o, MR

Regular: 1-44 m3, 45-58 e/o, 59, MR

Advanced: 1-58 m3, 59, 60-69 e/o, MR, assign w. Bonus Topic

### A

Simplify. Assume that all variables are nonnegative.

- |                                 |                                  |
|---------------------------------|----------------------------------|
| 1. $\sqrt{12}$                  | 2. $\sqrt{8}$                    |
| 3. $\sqrt{20}$                  | 4. $\sqrt{45}$                   |
| 5. $\sqrt{75}$                  | 6. $\sqrt{50}$                   |
| 7. $\sqrt{200}$                 | 8. $\sqrt{300}$                  |
| 9. $\sqrt{3x^2}$                | 10. $\sqrt{5y^2}$                |
| 11. $\sqrt{16a}$                | 12. $\sqrt{49b}$                 |
| 13. $\sqrt{13x^2}$              | 14. $\sqrt{29t^2}$               |
| 15. $\sqrt{9x}$                 | 16. $\sqrt{4y}$                  |
| 17. $\sqrt{64y^2}$              | 18. $\sqrt{9x^2}$                |
| 19. $\sqrt{8t^2}$               | 20. $\sqrt{125a^2}$              |
| 21. $\sqrt{4x^2 + 8x + 4}$      | 22. $\sqrt{3x^2 + 12x + 12}$     |
| 23. $\sqrt{2x^2 + 12x + 18}$    | 24. $\sqrt{5x^2 + 30x + 45}$     |
| 25. $\sqrt{4x^2 + 12xy + 9y^2}$ | 26. $\sqrt{3x^2 + 30xy + 75y^2}$ |

Simplify.

- |                                  |  |  |
|----------------------------------|--|--|
| 27. $\sqrt{x^6 x^3}$             | 28. $\sqrt{x^{10}}$                      | 29. $\sqrt{x^{12} x^6}$                    |
| 30. $\sqrt{x^{16}}$              | 31. $\sqrt{x^5 x^2 \sqrt{x}}$            | 32. $\sqrt{x^3}$                           |
| 33. $\sqrt{t^{19} t^9 \sqrt{t}}$ | 34. $\sqrt{p^{17}}$                      | 35. $\sqrt{(y-2)^8 (y-2)^4}$               |
| 36. $\sqrt{(x+3)^6}$             | 37. $\sqrt{4(x+5)^{10} 2(x+5)^6}$        | 38. $\sqrt{16(a-7)^4}$                     |
| 39. $\sqrt{36m^3 6m \sqrt{m}}$   | 40. $\sqrt{250y^3 5y \sqrt{10y}}$        | 41. $\sqrt{8a^5 2a^2 \sqrt{2a}}$           |
| 42. $\sqrt{12b^7}$               | 43. $\sqrt{448x^6 y^3 8x^3 y \sqrt{7y}}$ | 44. $\sqrt{243x^5 y^4 9x^2 y^2 \sqrt{3x}}$ |

### B

Simplify. Assume that all variables are nonnegative real numbers.

- |                           |                           |
|---------------------------|---------------------------|
| 45. $3\sqrt{200}$         | 46. $2\sqrt{75}$          |
| 47. $4\sqrt{12}$          | 48. $-3\sqrt{72}$         |
| 49. $-2\sqrt{1000}$       | 50. $6\sqrt{36x}$         |
| 51. $4m\sqrt{20m^2}$      | 52. $2x\sqrt{50x^4}$      |
| 53. $5r^2\sqrt{32r^4s^3}$ | 54. $3a^3\sqrt{28a^3b^5}$ |

Evaluate and simplify for  $r = 5$  and  $s = \sqrt{5}$ .

- |                    |                     |
|--------------------|---------------------|
| 55. $\sqrt{3+r^2}$ | 56. $\sqrt{r^2-1}$  |
| 57. $\sqrt{r+s^2}$ | 58. $\sqrt{50-s^2}$ |
59. **Critical Thinking** Find  $\sqrt{49}$ ,  $\sqrt{490}$ ,  $\sqrt{4900}$ ,  $\sqrt{49,000}$ , and  $\sqrt{490,000}$ . What pattern do you see?

### ADDITIONAL ANSWERS

#### Exercises

- |   |                               |
|---|-------------------------------|
| 1. $2\sqrt{3}$  | 2. $2\sqrt{2}$                |
| 3. $2\sqrt{5}$  | 4. $3\sqrt{5}$                |
| 5. $5\sqrt{3}$  | 6. $5\sqrt{2}$                |
| 7. $10\sqrt{2}$                                       | 8. $10\sqrt{3}$               |
| 9. $x\sqrt{3}$  | 10. $y\sqrt{5}$               |
| 11. $4\sqrt{a}$                                       | 12. $7\sqrt{b}$               |
| 13. $x\sqrt{13}$                                      | 14. $t\sqrt{29}$              |
| 15. $3\sqrt{x}$                                       | 16. $2\sqrt{y}$               |
| 17. $8y$  | 18. $3x$                      |
| 19. $2t\sqrt{2}$                                      | 20. $5a\sqrt{5}$              |
| 21. $2(x+1)$  |                               |
| 22. $(x+2)\sqrt{3}$                                   |                               |
| 23. $(x+3)\sqrt{2}$                                   |                               |
| 24. $(x+3)\sqrt{5}$                                   |                               |
| 25. $2x+3y$   |                               |
| 26. $(x+5y)\sqrt{3}$                                  |                               |
| 45. $30\sqrt{2}$                                      | 46. $10\sqrt{3}$              |
| 47. $8\sqrt{3}$                                       | 48. $-18\sqrt{2}$             |
| 49. $-20\sqrt{10}$                                    | 50. $36\sqrt{x}$              |
| 51. $8m^2\sqrt{5}$                                    | 52. $10x^3\sqrt{2}$           |
| 53. $20r^4s\sqrt{2s}$                                 | 54. $6a^4b^2\sqrt{7ab}$       |
| 55. $2\sqrt{7}$                                       | 56. $2\sqrt{6}$               |
| 57. $\sqrt{10}$                                       | 58. $3\sqrt{5}$               |
| 59. $\sqrt{49} = 7$                                   | $\sqrt{490} = 7\sqrt{10}$     |
| $\sqrt{4900} = 70$                                    | $\sqrt{49,000} = 70\sqrt{10}$ |
| $\sqrt{490,000} = 700$                                |                               |
| $\sqrt{49 \times 10^n} = \sqrt{49} \cdot \sqrt{10^n}$ | $= 7\sqrt{10^n}$              |