

# 6.2 EXERCISES

## HOMEWORK KEY

- = **WORKED-OUT SOLUTIONS**  
on p. WS1 for Exs. 5, 27, and 85
- ★ = **TAKS PRACTICE AND REASONING**  
Exs. 23, 51, 69, 86, 89, 91, and 92

### SKILL PRACTICE

1. **VOCABULARY** Are  $2\sqrt{5}$  and  $2\sqrt[3]{5}$  like radicals? *Explain* why or why not.
2. **WRITING** Under what conditions is a radical expression in simplest form?

#### EXAMPLE 1

on p. 420  
for Exs. 3–14

#### PROPERTIES OF RATIONAL EXPONENTS Simplify the expression.

- |   |   |                                     |                                  |
|---|---|-------------------------------------|----------------------------------|
| 3. $5^{3/2} \cdot 5^{1/2}$                        | 4. $(6^{2/3})^{1/2}$                          | 5. $3^{1/4} \cdot 27^{1/4}$         | 6. $\frac{9}{9^{-4/5}}$          |
| 7. $\frac{80^{1/4}}{5^{-1/4}}$                    | 8. $\left(\frac{7^3}{4^3}\right)^{-1/3}$      | 9. $\frac{11^{2/5}}{11^{4/5}}$      | 10. $(12^{3/5} \cdot 8^{3/5})^5$ |
| 11. $\frac{120^{-2/5} \cdot 120^{2/5}}{7^{-3/4}}$ | 12. $\frac{64^{5/9} \cdot 64^{2/9}}{4^{3/4}}$ | 13. $(16^{5/9} \cdot 5^{7/9})^{-3}$ | 14. $\frac{13^{3/7}}{13^{5/7}}$  |

#### EXAMPLE 3

on p. 421  
for Exs. 15–22

#### PROPERTIES OF RADICALS Simplify the expression.

- |  |                                      |  |  |
|--|--------------------------------------|--|--|
| 15. $\sqrt{20} \cdot \sqrt{5}$         | 16. $\sqrt[3]{16} \cdot \sqrt[3]{4}$ | 17. $\sqrt[4]{8} \cdot \sqrt[4]{8}$                      | 18. $(\sqrt[3]{3} \cdot \sqrt[4]{3})^{12}$                                 |
| 19. $\frac{\sqrt[5]{64}}{\sqrt[5]{2}}$ | 20. $\frac{\sqrt{3}}{\sqrt{75}}$     | 21. $\frac{\sqrt[4]{36} \cdot \sqrt[4]{9}}{\sqrt[4]{4}}$ | 22. $\frac{\sqrt[4]{8} \cdot \sqrt[4]{16}}{\sqrt[8]{2} \cdot \sqrt[8]{3}}$ |

#### EXAMPLE 4

on p. 422  
for Exs. 23–31

#### 23. **TAKS REASONING** What is the simplest form of the expression

$$3\sqrt[4]{32} \cdot (-6\sqrt[4]{5})?$$

- (A)  $\sqrt[4]{10}$       (B)  $-18\sqrt[4]{10}$       (C)  $-36\sqrt[4]{10}$       (D)  $36\sqrt[8]{10}$

#### SIMPLEST FORM Write the expression in simplest form.

- |                             |                               |                                       |  |
|-----------------------------|-------------------------------|---------------------------------------|--|
| 24. $\sqrt{72}$             | 25. $\sqrt[6]{256}$           | 26. $\sqrt[3]{108} \cdot \sqrt[3]{4}$ | 27. $5\sqrt[4]{64} \cdot 2\sqrt[4]{8}$ |
| 28. $\sqrt[3]{\frac{1}{6}}$ | 29. $\frac{3}{\sqrt[4]{144}}$ | 30. $\sqrt[6]{\frac{81}{4}}$          | 31. $\frac{\sqrt[3]{9}}{\sqrt[5]{27}}$ |

#### EXAMPLE 5


on p. 422  
for Exs. 32–41

#### COMBINING RADICALS AND ROOTS Simplify the expression.

- |   |   |                                      |
|---|---|--------------------------------------|
| 32. $2\sqrt[6]{3} + 7\sqrt[6]{3}$                     | 33. $\frac{3}{5}\sqrt[3]{5} - \frac{1}{5}\sqrt[3]{5}$ | 34. $25\sqrt[5]{2} - 15\sqrt[5]{2}$  |
| 35. $\frac{1}{8}\sqrt[4]{7} + \frac{3}{8}\sqrt[4]{7}$ | 36. $6\sqrt[3]{5} + 4\sqrt[3]{625}$                   | 37. $-6\sqrt[7]{2} + 2\sqrt[7]{256}$ |
| 38. $12\sqrt[4]{2} - 7\sqrt[4]{512}$                  | 39. $2\sqrt[4]{1250} - 8\sqrt[4]{32}$                 | 40. $5\sqrt[3]{48} - \sqrt[3]{750}$  |

#### ERROR ANALYSIS Describe and correct the error in simplifying the expression.

41. 
$$2\sqrt[3]{10} + 6\sqrt[3]{5} = (2 + 6)\sqrt[3]{15}$$

$$= 8\sqrt[3]{15}$$


42. 
$$\sqrt[3]{\frac{x}{y^2}} = \sqrt[3]{\frac{x}{y^2 \cdot y}} = \sqrt[3]{\frac{x}{y^3}}$$

$$= \frac{\sqrt[3]{x}}{y}$$
