

**Practice 7-4****Rational Exponents**

Simplify each expression. Assume that all variables are positive.

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|---|---|--|
| 1. $27^{\frac{1}{3}}$                       | 2. $(81^{\frac{1}{4}})^4$                       | 3. $(32^{\frac{1}{5}})^5$                        |
| 4. $(256^4)^{\frac{1}{4}}$                  | 5. $7^0$  | 6. $8^{\frac{2}{3}}$                             |
| 7. $(-1)^{\frac{1}{5}}$                     | 8. $(-27)^{\frac{2}{3}}$                        | 9. $16^{\frac{1}{4}}$                            |
| 10. $x^{\frac{1}{2}} \cdot x^{\frac{1}{3}}$ | 11. $2y^{\frac{1}{2}} \cdot y$                  | 12. $(8^2)^{\frac{1}{3}}$                        |
| 13. $3.6^0$                                 | 14. $(\frac{1}{16})^{\frac{1}{4}}$              | 15. $(\frac{27}{8})^{\frac{2}{3}}$               |
| 16. $\sqrt[8]{0}$                           | 17. $(3x^{\frac{1}{2}})(4x^{\frac{2}{3}})$      | 18. $\frac{12y^{\frac{1}{3}}}{4y^{\frac{1}{2}}}$ |
| 19. $(3a^{\frac{1}{2}}b^{\frac{1}{3}})^2$   | 20. $(y^{\frac{2}{3}})^{-9}$                    | 21. $(a^{\frac{2}{3}}b^{-\frac{1}{2}})^{-6}$     |
| 22. $y^{\frac{2}{5}} \cdot y^{\frac{3}{8}}$ | 23. $(\frac{x^{\frac{4}{2}}}{x^{\frac{3}{3}}})$ | 24. $(2a^4)^3$                                   |
| 25. $81^{-\frac{1}{2}}$                     | 26. $(2x^{\frac{2}{5}})(6x^{\frac{1}{4}})$      | 27. $(9x^4y^{-2})^{\frac{1}{2}}$                 |

28. The interest rate  $r$  required to increase your investment  $p$  to the amount  $a$  in  $t$  years is found by  $r = (\frac{a}{p})^{\frac{1}{t}} - 1$ . What interest rate would be required to increase your investment of \$2700 to \$3600 over three years? Round your answer to the nearest tenth of a percent.

Write each expression in radical form.

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|-----------------------|--------------------------|--------------------------|
| 29. $x^{\frac{4}{3}}$ | 30. $(2y)^{\frac{1}{3}}$ | 31. $a^{1.5}$            |
| 32. $b^{\frac{1}{5}}$ | 33. $z^{\frac{2}{3}}$    | 34. $(ab)^{\frac{1}{4}}$ |
| 35. $m^{2.4}$         | 36. $t^{-\frac{2}{7}}$   | 37. $a^{-1.6}$           |

Write each expression in exponential form.

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|----------------------|-----------------------|-------------------------|
| 38. $\sqrt{x^3}$     | 39. $\sqrt[3]{m}$     | 40. $\sqrt{5y}$         |
| 41. $\sqrt[3]{2y^2}$ | 42. $(\sqrt[4]{b})^3$ | 43. $\sqrt{-6}$         |
| 44. $\sqrt{(6a)^4}$  | 45. $\sqrt[5]{n^4}$   | 46. $\sqrt[4]{(5ab)^3}$ |