Name _____ Class _____ Date _____

Practice 7-4

Rational Exponents

Simplify each expression. Assume that all variables are positive.

1. $27^{\frac{1}{3}}$

2. $\left(81^{\frac{1}{4}}\right)^4$

3. $\left(32^{\frac{1}{5}}\right)^5$

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. $\left(\frac{1}{16}\right)^{\frac{1}{4}}$

15. $\left(\frac{27}{8}\right)^{\frac{2}{3}}$

16. $\sqrt[8]{0}$

17. $\left(3x^{\frac{1}{2}}\right)\left(4x^{\frac{2}{3}}\right)$

18. $\frac{12y^{\frac{1}{3}}}{4y^{\frac{1}{2}}}$

19. $\left(3a^{\frac{1}{2}}b^{\frac{1}{3}}\right)^2$

20. $\left(y^{\frac{2}{3}}\right)^{-9}$

21. $\left(a^{\frac{2}{3}}b^{-\frac{1}{2}}\right)^{-6}$

22. $y^{\frac{2}{5}} \cdot y^{\frac{3}{8}}$

23. $\left(\frac{x^{\frac{4}{7}}}{x^{\frac{2}{3}}}\right)$

24. $\left(2a^{\frac{1}{4}}\right)^3$

25. $81^{-\frac{1}{2}}$

26. $\left(2x^{\frac{2}{5}}\right)\left(6x^{\frac{1}{4}}\right)$

27. $\left(9x^4y^{-2}\right)^{\frac{1}{2}}$

28. The interest rate r required to increase your investment p to the amount a in t years is found by $r = \left(\frac{a}{p}\right)^{\frac{1}{t}} - 1$. 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.

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.

38. $\sqrt{x^3}$

39. $\sqrt[3]{m}$

40. $\sqrt{5y}$

41. $\sqrt[3]{2y^2}$

42. $\left(\sqrt[4]{b}\right)^3$

43. $\sqrt{-6}$

44. $\sqrt{(6a)^4}$

45. $\sqrt[5]{n^4}$

46. $\sqrt[4]{(5ab)^3}$