Name_____ Class _____ Date_____

Extra Practice

Chapter 11

Simplify each radical expression. Use absolute value symbols as needed.

1. $\sqrt{36x^4}$ **2.** $\sqrt{c^{80}d^{50}}$ **3.** $\sqrt[4]{81x^{12}}$

4. $\sqrt[3]{-64}$ **5.** $\sqrt[5]{-32k^5}$ **6.** $\sqrt[4]{\frac{1}{16}w^{12}}$

7. $\sqrt[4]{m^{18}n^8}$ **8.** $\sqrt[3]{27y^{15}}$ **9.** $\sqrt[5]{-243r^{20}}$

10. You can use the expression $D = 1.2\sqrt{h}$ to approximate the visibility range D, in miles, from a height of h feet above ground.

a. Estimate the visibility from a height of 900 feet.

b. How far above ground is an observer whose visibility range is 84 miles?

11. You can approximate the speed of a falling object as $v = 8\sqrt{d}$, where v is the speed in feet per second and d is the distance, in feet, the object has fallen. Express d in terms of v.

Multiply or divide and simplify. Assume that all variables are positive.

12. $\sqrt{3x^4}.\sqrt{24x^3}$ **13.** $\sqrt[3]{4}.\sqrt[3]{18}$ **14.** $\sqrt{5a^3}.\sqrt{20a}$

15. $\frac{\sqrt{80}}{\sqrt{5}}$ **16.** $\frac{\sqrt{18x^5y}}{\sqrt{2x}}$ **17.** $\frac{\sqrt[3]{640w^3z^8}}{\sqrt[3]{5wz^4}}$

18. The time T it takes a pendulum to make a full swing in each direction and return to its original position is called the period of the pendulum. The equation $T = 2\pi\sqrt{\frac{l}{32}}$ relates the length of the pendulum l, in feet, to its period T, in seconds. How long is a pendulum if its period is 3 seconds? Round the answer to the nearest tenth.

Simplify.

19. $2\sqrt{7} + 3\sqrt{7}$ **20.** $\sqrt{32} + \sqrt{8}$ **21.** $\sqrt{7x} + \sqrt{28x}$

22. $3\sqrt{18} + 2\sqrt{72}$ **23.** $\sqrt{27} + \sqrt{48}$ **24.** $8\sqrt{45} - 3\sqrt{80}$

25. $\left(2+\sqrt{5}\right)\left(3+\sqrt{5}\right)$ **26.** $\left(6-\sqrt{7}\right)\left(1-\sqrt{7}\right)$ **27.** $\left(\sqrt{10}+3\right)^2$

28. $\left(3\sqrt{5}-2\right)\left(3\sqrt{5}+2\right)$ **29.** $\frac{5}{2-\sqrt{3}}$ **30.** $\frac{4-3\sqrt{7}}{1+2\sqrt{7}}$

Name_____ Class _____ Date_____

Extra Practice (continued)

Chapter 11

Write each expression in simplest form. Assume that all variables are positive.

31. $81^{\frac{1}{2}}$

32. $36^{\frac{1}{4}} \cdot 36^{\frac{1}{4}}$

33. $\left(x^{-\frac{4}{3}} y^{\frac{3}{5}}\right)^{15}$

34. $\left(x^{\frac{1}{4}} y^{-\frac{3}{8}}\right)^{16}$

35. $\left(8x^{15}y - 9\right)^{-\frac{1}{3}}$

36. $\left(-27x^{-9}y^{6}\right)^{\frac{1}{3}}$

37. $\left(-32x^{-10}y^{15}\right)^{\frac{1}{5}}$

38. $\left(32x^{20}y^{-10}\right)^{-\frac{1}{5}}$

39. $\left(\frac{81y^{16}}{16x^{12}}\right)^{\frac{1}{4}}$

40. $\left(\frac{16x^{14}}{81y^{18}}\right)^{\frac{1}{2}}$

41. $\sqrt{5} \cdot \sqrt[3]{5}$

42. $\frac{\sqrt[6]{x^2}}{\sqrt[3]{x^5}}$

Lesson 6-5

Solve. Check for extraneous solutions.

43. $\sqrt{13x - 10} = 3x$

44. $\sqrt{x + 20} = x$

45. $\left(4x - 12\right)^{\frac{1}{2}} + 3 = x$

46. $\left(7x\right)^{\frac{1}{3}} = \left(5x + 2\right)^{\frac{1}{3}}$

47. $\sqrt{x - 2} - \sqrt{2x + 3} = -2$

48. $\sqrt{10x} - 2\sqrt{5x - 25} = 0$

For each function *f*, find f^{-1} and the domain and range of *f* and f^{-1}. Determine whether f^{-1} is a function.

49. $f(x) = 6x + 1$

50. $f(x) = \sqrt{x + 4}$

51. $f(x) = \sqrt{x - 3}$

52. $f(x) = \sqrt{-5x + 2}$

53. $f(x) = 3x^2 + 1$

54. $f(x) = 2 - x^2$