Unit 5 Review

Date_____

Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.

1) $\left(\dfrac{m^{\frac{7}{4}}n^{-1}p^{2}\cdot pm^{2}n^{\frac{1}{2}}}{n^{\frac{4}{3}}}\right)^{2}$

2) $\dfrac{\left(x^{-\frac{5}{4}}y^{\frac{1}{3}}z^{-\frac{3}{2}}\right)^{-\frac{3}{2}}}{x^{\frac{1}{2}}y^{2}z^{\frac{1}{2}}\cdot y^{-\frac{1}{4}}z^{\frac{7}{4}}}$

3) $\left(\dfrac{x^{-2}z^{-\frac{5}{4}}}{x^{\frac{7}{4}}y^{2}\cdot x^{-1}y^{\frac{3}{2}}}\right)^{-\frac{7}{4}}$

4) $\dfrac{zx^{2}\cdot x^{2}\cdot yx^{\frac{2}{3}}z^{2}}{\left(x^{-\frac{1}{2}}y^{4}z^{2}\right)^{-2}}$

Write each expression in exponential form.

5) $\left(\sqrt[3]{7k}\right)^{4}$

6) $\dfrac{1}{\left(\sqrt[6]{2a}\right)^{7}}$

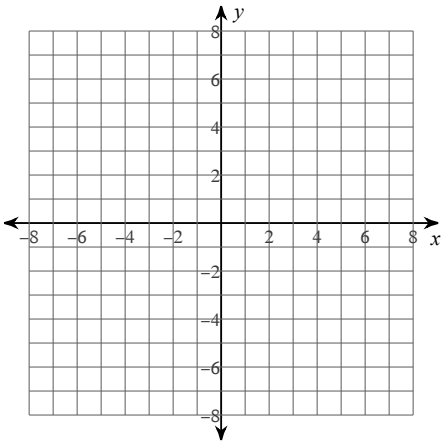
Write each expression in radical form.

7) $(3p)^{\frac{5}{2}}$

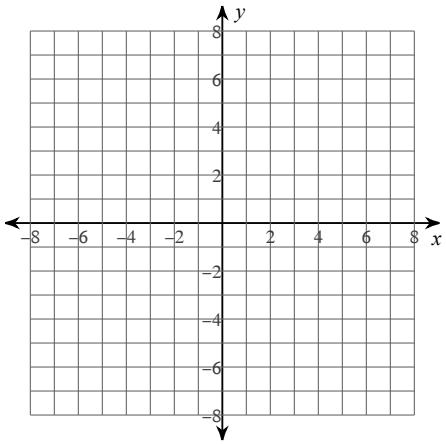
8) $(6n)^{\frac{2}{3}}$

Create an *x*-*y* table to sketch the graph of the function. Then identify the domain and range of each.

9) $y = \log(x + 5) + 5$



10) $y = \ln(x + 1) + 4$



Find the total value of the investment after the time given.

11) Use the compound interest formula, $A = P\left(1 + \frac{r}{n}\right)^{nt}$, to find the total amount if \$25,700 in invested at an interest rate of 4% and compounded daily for 5 years.

12) Use the continuous compounding formula, $A = Pe^{rt}$ to find the total amount if \$13,800 is invested at an interest rate of 6.6% and compounded continuously for 2 years.

Rewrite each equation in exponential form.

13) $\log_x 15 = -\frac{1}{2}$

14) $\log_9 x = -2$

15) $\log n = 20$

16) $\ln y = x$

Rewrite each equation in logarithmic form.

17) $v^u = 107$

18) $y^4 = x$

19) $10^n = 107$

20) $e^u = v$

Use a calculator to approximate each to the nearest thousandth.

21) $\log 38$

22) $\ln 5.5$

23) $\log_5 3.95$

24) $\log_6 2.9$

Expand each logarithm.

25) $\log_9 x^3$

26) $\log_5 (x \cdot y)$

27) $\log_5 \frac{x}{y}$

28) $\log_3 (a \cdot b)^2$

29) $\log_8 \frac{x^6}{y}$

30) $\log_6 (ab^5)$

31) $\log_8 (uv^5 \cdot w)^5$

32) $\log_7 \frac{zx^6}{y^2}$

33) $\log_2 \left(\frac{x^4}{y \cdot z}\right)^3$

Condense each expression to a single logarithm.

34) $5\log_4 u$

35) $\log_6 a - \log_6 b$

36) $\log_3 a + \log_3 b$

37) $4\log_4 u + 4\log_4 v$

38) $\log_5 x - 5\log_5 y$

39) $5\log_5 a + 5\log_5 b$

40) $3\log_2 w + 3\log_2 u + 12\log_2 v$

41) $4\ln u + 8\ln v + 4\ln w$

42) $3\ln a - \ln c - 6\ln b$

Solve each equation.

43) $-8 \cdot 10^{p} = -99$

44) $3 \cdot 11^{p+1} = 41$

45) $-8e^{8-8m} = -94.8$

46) $18^{v-4} = 2$

47) $16^{r+2} + 2 = 75$

48) $6 \cdot 10^{4k} - 10 = 61$

49) $10 \log_{9} x = 30$

50) $-3 + \ln(x + 2) = 0$

51) $10 + \log_{6}(-7k - 7) = 14$

52) $\log_{5}(a - 3) = 2$

53) $-7 \ln 2v = -28$

54) $5 \log_7 4v - 3 = -13$

55) $\log (4x + 3) = \log 5x$

56) $\ln x + \ln 6 = 3$

57) $\ln (x + 5) - \ln x = 2$

58) $\log_6 (x + 2) + \log_6 10 = 2$

59) $\ln 6 + \ln (3x - 3) = 4$

60) $\ln 9 - \ln (3 - 4x) = 5$