

## Cumulative Review

Date \_\_\_\_\_ Period \_\_\_\_\_

Solve each equation. Remember to check for extraneous solutions.

1)  $x = \sqrt{56 - x}$

$$x^2 + x - 56 = 0$$

$$(x+8)(x-7) = 0$$

$$x = -8 \quad x = 7$$

3)  $\sqrt{2k+14} = \sqrt{3k+20}$

$$2k+14 = 3k+20$$

$$-6 = k$$

2)  $-5 = \sqrt{15x+1} - 9$

$$\frac{+9}{4} = \frac{+9}{\sqrt{15x+1}} \quad 2$$

$$16 = 15x + 1$$
$$15 = 15x$$
$$1 = x$$

Write each expression in radical form.

4)  $n^{\frac{3}{2}}$

$$\sqrt{n^3}$$

5)  $(3n)^{\frac{5}{4}}$

$$\sqrt[4]{(3n)^5}$$

Write each expression in exponential form.

6)  $(\sqrt[3]{6b})^2$

$$(6b)^{\frac{2}{3}}$$

7)  $\sqrt[2]{n}$

$$n^{\frac{1}{2}}$$

Simplify.

8)  $216^{\frac{2}{3}}$

$$\sqrt[3]{216^2}$$

$$36$$

9)  $64^{\frac{2}{3}}$

$$\sqrt[3]{64^2}$$

$$16$$

10)  $9^{\frac{1}{2}}$

$$\sqrt{9}$$

$$3$$

11)  $81^{\frac{3}{2}}$

$$\sqrt{81^3}$$

$$729$$

Solve each equation.

12)  $3m^{\frac{3}{2}} + 8 = 2195$

$$3m^{\frac{3}{2}} = 2187$$

$$m^{\frac{3}{2}} = 729$$

$$m = \sqrt[3]{729^2} = 81$$

14)  $(2x - 3)^2 = 343$

$$2x - 3 = \sqrt[3]{343^2}$$

$$2x - 3 = 49$$

$$2x = 52 \quad x = 26$$

Rewrite each equation in exponential form.

15)  $\log_5 25 = 2$

$$5^2 = 25$$

13)  $864 = 4x^{\frac{3}{2}}$

$$216 = x^{\frac{3}{2}}$$

$$\sqrt[3]{216^2} = x$$

$$36 = x$$

Rewrite each equation in logarithmic form.

17)  $3^4 = 81$

$$\log_3 81 = 4$$

18)  $81^{\frac{1}{2}} = 9$

$$\log_{81} 9 = \frac{1}{2}$$

Evaluate each expression.

19)  $\log_3 \frac{1}{9} = x$

$$3^x = \frac{1}{9}$$

$$x = -2$$

20)  $\log_3 27$

$$3^x = 27$$

$$x = 3$$

21)  $\log_2 \frac{1}{64}$

$$2^x = \frac{1}{64}$$

$$x = -6$$

22)  $\log_4 64$

$$4^x = 64$$

$$x = 3$$

Expand each logarithm.

23)  $\log_6 \left( \frac{10^6}{3^6} \right)$

$6 \log_6 10 - 36 \log_6 3$   
 $\log_6 \frac{10^6}{3^6} = \log_6 10^6 - \log_6 3^6$   
 $6 \log_6 10 - 36 \log_6 3$

Condense each expression to a single logarithm.

25)  $3 \log_8 u + 6 \log_8 v$

$\log_8 (u^3 v^6)$

24)  $\log_8 (2^6 \cdot 5^4)$

$24 \log_8 2 + 4 \log_8 5$

26)  $10 \log_5 x - 2 \log_5 y$

$\log_5 \left( \frac{x^{10}}{y^2} \right)$

Solve each equation.

27)  $\log_8 (4x + 5) = \log_8 (3x + 6)$

$4x + 5 = 3x + 6$

$x = 1$

29)  $\log_5 (x) + \log_5 (x + 15) = \log_5 34$

$x^2 + 15x - 34 = 0$   
 $(x + 17)(x - 2) = 0$

$x = 2$

31)  $3^{-3n-2} = 9^2$

$-3n - 2 = 2$

$n = -\frac{4}{3}$

28)  $\log_9 (10x + 1) = \log_9 (x^2 + 10)$

$10x + 1 = x^2 + 10$

$x^2 - 10x + 9 = 0$

$(x - 9)(x - 1) = 0$

$x = 9, x = 1$

30)  $\log_3 (x^2 - 9) - \log_3 8 = 3$

$\log_3 \left( \frac{x^2 - 9}{8} \right) = 3$

$\frac{x^2 - 9}{8} = 27$

$x^2 - 9 = 216$

$x^2 = 225$

$x = \pm 15$

32)  $\left( \frac{1}{625} \right)^{3p-3} = 125^{3p}$

$(5^{-4})^{3p-3} = (5^3)^{3p}$

$-12p + 12 = 9p$

$p = \frac{12}{21} = \frac{4}{7}$

Solve each equation. Round your answers to the nearest ten-thousandth.

33)  $7^{-6n} + 6 \cdot 8^9$

$\frac{\log 83}{\log 7} = -6n$

$2.27 = -6n$   
 $-0.3784 = n$

35)  $e^{b+4} = 8$

$e^{b+4} = 8$

$b = -1.8028$

34)  $-5 \cdot 11^{n+2} = -2$

$11^{n+2} = \frac{2}{5}$

$\log_{11} \frac{2}{5} = n + 2$

$\frac{\log \frac{2}{5}}{\log 11} = n + 2$

36)  $4e^{x+10} = 52$

$e^{x+10} = 13$

$x + 10 = \ln(13)$

$x = \ln(13) - 10 = -7.4351$

