Log Review Sheet

6.4 Exercises

① $2^{3x} = 32$

$2^{3x} = 2^5$

$3x = 5$

$x = 5/3$

② $3^{-2} = 2c$

$\frac{1}{9} = 2c$

$\frac{1}{18} = c$

③ $(2x)^{-2} = 16$

$\frac{1}{4x^2} = 16$

$1 = 64x^2$

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

$\frac{1}{8} = x$

④ $25^{1/2} = \frac{x}{2}$

$5 = \frac{x}{2}$

$10 = x$

⑤ $4^2 = 5x + 1$

$16 = 5x + 1$

$15 = 5x$

$3 = x$

⑥ $8^{2/3} = x - 5$

$4 = x - 5$

$9 = x$

⑦ $3x - 1 = 2x + 3$

$x = 4$

⑧ $x^2 - 6 = 2x + 2$

$x^2 - 2x - 8 = 0$

$(x-4)(x+2) = 0$

$x = 4$ ~~$x = -2$~~

⑨ $(x+4)^3 = 27$

$x + 4 = 3$

$x = -1$

⑩ $2^4 = x + 3$

$16 = x + 3$

$13 = x$

⑪ $x^3 = 1000$

$x = 10$

⑫ $8^2 = 4x + 4$

$64 = 4x + 4$

$60 = 4x$

$15 = x$

⑬ $x = 12$

⑭ $x - 5 = 13$

$x = 18$

⑮ $x = 5x - 20$

$-4x = -20$

$x = 5$

⑯ $x = 2x - 1$

$-x = -1$

$x = 1$

⑰ $x + 12 = 4x$

$12 = 3x$

$4 = x$

⑱ $x - 3 = 2x$

$-3 = x$

(19) $2x > 2^2$

$2x > 4$

$x > 2$

(20) $x > 5^2$

$x > 25$

(21) $3x+1 < 2^4$

$3x+1 < 16$

$3x < 15$

$0 < x < 5$

(22) $2x > 4^{-1/2}$

$2x > \frac{1}{2}$

$x > 1$

(23) $(x+3) < 3^3$

$x+3 < 27$

$0 < x < 24$

(24) $6x > 27^{2/3}$

$6x > 9$

$x > 3/2$

(25) $5x < 30$

$0 < x < 6$

(26) $x < 2x-4$

$-x < -4$

$x > 4$

(27) $3x < 7x-8$

$-4x < -8$

$x > 2$

(28) $8x+5 > 9x-18$

$-x > -23$

$2 < x < 23$

$8x+5 > 0$ $\quad 9x-18 > 0$

$8x > -5$ $\quad 9x > 18$

$x > -\frac{5}{8}$ $\quad x > 2$

(29) $3x+7 < 7x-3$

$-4x < -10$

$x > 5/2$

(30) $3x-4 < 2x+7$

$\frac{4}{3} < x < 11$

$3x-4 > 0$ $\quad 2x+7 > 0$

$3x > 4$ $\quad 2x > -7$

$x > 4/3$ $\quad x > -\frac{7}{2}$

* (31) $\log_2 10^3$

$3 \log_2 10$

$2^y = 10^3$

Name Key

Date _____ Period ____

The Meaning Of Logarithms

Rewrite each equation in exponential form.

1) $\log_6 36 = 2$ $6^2 = 36$

2) $\log_{289} 17 = \frac{1}{2}$ $289^{1/2} = 17$

3) $\log_{14} \frac{1}{196} = -2$ $14^{-2} = \frac{1}{196}$

4) $\log_3 81 = 4$ $3^4 = 81$

Rewrite each equation in logarithmic form.

5) $64^{\frac{1}{2}} = 8$ $\log_{64} 8 = 1/2$

6) $12^2 = 144$ $\log_{12} 144 = 2$

7) $9^{-2} = \frac{1}{81}$ $\log_9 1/81 = -2$

8) $\left(\frac{1}{12}\right)^2 = \frac{1}{144}$ $\log_{(1/12)} 1/144 = 2$

Rewrite each equation in exponential form.

9) $\log_u \frac{15}{16} = v$ $u^v = 15/16$

10) $\log_v u = 4$ $v^4 = u$

11) $\log_{\frac{1}{4}} x = y$ $1/4^y = x$

12) $\log_2 v = u$ $2^u = v$

13) $\log_u v = -16$ $u^{-16} = v$

14) $\log_y x = -8$ $y^{-8} = x$

Rewrite each equation in logarithmic form.

15) $u^{-14} = v$ $\log_u v = -14$

16) $8^b = a$ $\log_8 a = b$

17) $\left(\frac{1}{5}\right)^x = y$ $\log_{1/5} y = x$

18) $6^x = y$ $\log_6 x = y$

19) $9^x = x$ $\log_9 x = y$

20) $b^a = 123$ $\log_b 123 = a$

Evaluate each expression.

21) $\log_4 64$ 3

22) $\log_6 216$ 3

23) $\log_4 16$ 2

24) $\log_3 \frac{1}{243}$ -5

25) $\log_5 125$ 3

26) $\log_2 4$ 2

27) $\log_{343} 7$ 1/3

28) $\log_2 16$ 4

29) $\log_{64} 4$ 1/3

30) $\log_6 \frac{1}{216}$ -3

Simplify each expression.

31) $12^{\log_{12} 144}$ 144

32) $5^{\log_5 17}$ 17

33) $x^{\log_x 72}$ 72

34) $9^{\log_3 20}$ $3^{2\log_3 20}$ 400 $3\log_3 20^2$