Name_____

The Meaning Of Logarithms

Date_____ Period_____

Rewrite each equation in exponential form.

1) $\log_6 36 = 2$

2) $\log_{289} 17 = \dfrac{1}{2}$

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

4) $\log_3 81 = 4$

Rewrite each equation in logarithmic form.

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

6) $12^2 = 144$

7) $9^{-2} = \dfrac{1}{81}$

8) $\left(\dfrac{1}{12}\right)^2 = \dfrac{1}{144}$

Rewrite each equation in exponential form.

9) $\log_u \dfrac{15}{16} = v$

10) $\log_v u = 4$

11) $\log_{\frac{7}{4}} x = y$

12) $\log_2 v = u$

13) $\log_u v = -16$

14) $\log_y x = -8$

Rewrite each equation in logarithmic form.

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

16) $8^b = a$

17) $\left(\dfrac{1}{5}\right)^x = y$

18) $6^y = x$

19) $9^y = x$

20) $b^a = 123$

Evaluate each expression.

21) $\log_4 64$

22) $\log_6 216$

23) $\log_4 16$

24) $\log_3 \dfrac{1}{243}$

25) $\log_5 125$

26) $\log_2 4$

27) $\log_{343} 7$

28) $\log_2 16$

29) $\log_{64} 4$

30) $\log_6 \dfrac{1}{216}$

Simplify each expression.

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

32) $5^{\log_5 17}$

33) $x^{\log_x 72}$

34) $9^{\log_3 20}$

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   $6^2 = 36$

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4) $\log_3 81 = 4$

   $3^4 = 81$

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   $\log_{64} 8 = \dfrac{1}{2}$

6) $12^2 = 144$

   $\log_{12} 144 = 2$

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   $\log_9 \dfrac{1}{81} = -2$

8) $\left(\dfrac{1}{12}\right)^2 = \dfrac{1}{144}$

   $\log_{\frac{1}{12}} \dfrac{1}{144} = 2$

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    $y^{-8} = x$

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    $\log_8 a = b$

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$\log_{6} x = y$

19) $9^{y} = x$

$\log_{9} x = y$

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) $\log_{3} \dfrac{1}{243}$

−5

25) $\log_{5} 125$

3

26) $\log_{2} 4$

2

27) $\log_{343} 7$

$\dfrac{1}{3}$

28) $\log_{2} 16$

4

29) $\log_{64} 4$

$\dfrac{1}{3}$

30) $\log_{6} \dfrac{1}{216}$

−3

Simplify each expression.

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

144

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

17

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

72

34) $9^{\log_{3} 20}$

400