Math 3 Name_____

PRACTICE Test 7 Logarithms

Rewrite each equation in logarithmic form.

1) $y^{-10} = x$

2) $2^2 = 4$

Rewrite each equation in exponential form.

3) $\log_{20} b = a$

4) $\log_{\frac{1}{8}} \frac{1}{64} = 2$

Use a calculator to approximate each to the nearest thousandth.

5) $\ln 2.1$

6) $\log_4 2.9$

Find the inverse of each function.

7) $y = 10\log_5 x$

8) $y = 9\log_5 x$

Simplify the expression.

9) $\log_9 \left(uv^3\right)^6$

10) $\log_3 \sqrt[3]{u \cdot v \cdot w}$

Condense each expression to a single logarithm.

11) $\log_9 3 + \log_9 11 + 6\log_9 7$

12) $\frac{\log_4 2}{3} + \frac{\log_4 11}{3} + \frac{\log_4 3}{3}$

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

13) $11^x - 3.3 = 34$

14) $12^{-10a} + 1 = 60$

15) $-5 \cdot 16^{-5x} - 9 = -41$

16) $-7 \cdot 3^{3.2 - 8n} - 5 = -72$

Solve each equation.

17) $\log_9 7 + \log_9 x = 2$

18) $\log (x - 6) + \log 3 = 2$

19) $\log_9 3 - \log_9 (-x - 5) = 1$

20) $\log_7 3 + \log_7 (2 - 3x) = \log_7 61$

Math 3 Name_____

PRACTICE Test 7 Logarithms

Rewrite each equation in logarithmic form.

1) $y^{-10} = x$

$\log_y x = -10$

2) $2^2 = 4$

$\log_2 4 = 2$

Rewrite each equation in exponential form.

3) $\log_{20} b = a$

$20^a = b$

4) $\log_{\frac{1}{8}} \frac{1}{64} = 2$

$\left(\frac{1}{8}\right)^2 = \frac{1}{64}$

Use a calculator to approximate each to the nearest thousandth.

5) $\ln 2.1$

0.742

6) $\log_4 2.9$

0.768

Find the inverse of each function.

7) $y = 10 \log_5 x$

$y = 5^{\frac{x}{10}}$

8) $y = 9 \log_5 x$

$y = 5^{\frac{x}{9}}$

Simplify the expression.

9) $\log_9 \left(uv^3\right)^6$

$6 \log_9 u + 18 \log_9 v$

10) $\log_3 \sqrt[3]{u \cdot v \cdot w}$

$\frac{\log_3 u}{3} + \frac{\log_3 v}{3} + \frac{\log_3 w}{3}$

Condense each expression to a single logarithm.

11) $\log_9 3 + \log_9 11 + 6\log_9 7$

$\log_9 \left(33 \cdot 7^6\right)$

12) $\frac{\log_4 2}{3} + \frac{\log_4 11}{3} + \frac{\log_4 3}{3}$

$\log_4 \sqrt[3]{66}$

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

13) $11^x - 3.3 = 34$

1.5092

14) $12^{-10a} + 1 = 60$

–0.1641

15) $-5 \cdot 16^{-5x} - 9 = -41$

–0.1339

16) $-7 \cdot 3^{3.2 - 8n} - 5 = -72$

0.143

Solve each equation.

17) $\log_9 7 + \log_9 x = 2$

$\left\{\frac{81}{7}\right\}$

18) $\log\left(x - 6\right) + \log 3 = 2$

$\left\{\frac{118}{3}\right\}$

19) $\log_9 3 - \log_9 \left(-x - 5\right) = 1$

$\left\{-\frac{16}{3}\right\}$

20) $\log_7 3 + \log_7 \left(2 - 3x\right) = \log_7 61$

$\left\{-\frac{55}{9}\right\}$