Pre-Calc - Logarithms Name_____

Use a calculator to approximate each to the nearest thousandth.

1) $\log_5 42$

2) $\log_4 3.9$

3) $\log_3 2.05$

4) $\log_5 6.7$

Expand each logarithm.

5) $\log_2 \left(\frac{x^4}{y}\right)^2$

6) $\log_3 \frac{x^2}{y^5}$

7) $\log_3 \left(z\sqrt{x \cdot y}\right)$

8) $\log_9 \frac{a^2}{b^4}$

9) $\log_4 \left(\frac{a^3}{b}\right)^2$

10) $\log_2 \left(u^6 v^3\right)$

Condense each expression to a single logarithm.

11) $30\log_8 u - 5\log_8 v$

12) $2\log_8 a + 3\log_8 b$

13) $\log_2 x + \log_2 y + 6\log_2 z$

14) $6\log_3 a + 3\log_3 b$

15) $2\log_4 u - 6\log_4 v$

16) $6\log_9 x - 12\log_9 y$

Solve each equation.

17) $\log_3 4 - \log_3 -2x = 2$

18) $\log_3 10 + \log_3 4x = 4$

19) $\log_5 3 - \log_5 (x + 2) = 1$

20) $\log_7 -x + \log_7 9 = 2$

21) $\log_4 (x + 9) + \log_4 10 = 3$

22) $\log_5 x + \log_5 (x + 6) = \log_5 16$

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

23) $13^{-k} + 5 = 40$

24) $2^{-5.4a} - 7 = 64$

25) $3 \cdot 3^{n-2} = 60$

26) $5^{x+8} + 7 = 61.9$

27) $8 \cdot 15^{-8n} = 28$

28) $-7 \cdot 15^{4.1m} = -85$

Solve each equation.

29) $\log_3 (x + 10) - \log_3 6 = 2$

30) $\log_8 10 - \log_8 (x - 3) = \log_8 48$

31) $\log_9 6 - \log_9 -4x = \log_9 61$

32) $\log_6 x - \log_6 (x - 4) = 1$

33) $\log_4 9 + \log_4 4x = \log_4 53$

34) $\log_7 6 - \log_7 (x + 5) = 1$

Pre-Calc - Logarithms Name_____

Use a calculator to approximate each to the nearest thousandth.

1) $\log_5 42$

2.322

2) $\log_4 3.9$

0.982

3) $\log_3 2.05$

0.653

4) $\log_5 6.7$

1.182

Expand each logarithm.

5) $\log_2 \left(\frac{x^4}{y}\right)^2$

$8\log_2 x - 2\log_2 y$

6) $\log_3 \frac{x^2}{y^5}$

$2\log_3 x - 5\log_3 y$

7) $\log_3 \left(z\sqrt{x \cdot y}\right)$

$\log_3 z + \frac{\log_3 x}{2} + \frac{\log_3 y}{2}$

8) $\log_9 \frac{a^2}{b^4}$

$2\log_9 a - 4\log_9 b$

9) $\log_4 \left(\frac{a^3}{b}\right)^2$

$6\log_4 a - 2\log_4 b$

10) $\log_2 \left(u^6 v^3\right)$

$6\log_2 u + 3\log_2 v$

Condense each expression to a single logarithm.

11) $30\log_8 u - 5\log_8 v$

$\log_8 \frac{u^{30}}{v^5}$

12) $2\log_8 a + 3\log_8 b$

$\log_8 \left(b^3 a^2\right)$

13) $\log_2 x + \log_2 y + 6\log_2 z$

$\log_2 \left(yxz^6\right)$

14) $6\log_3 a + 3\log_3 b$

$\log_3 \left(b^3 a^6\right)$

15) $2\log_4 u - 6\log_4 v$

$\log_4 \frac{u^2}{v^6}$

16) $6\log_9 x - 12\log_9 y$

$\log_9 \frac{x^6}{y^{12}}$

Solve each equation.

17) $\log_3 4 - \log_3 -2x = 2$

$\left\{-\frac{2}{9}\right\}$

18) $\log_3 10 + \log_3 4x = 4$

$\left\{\frac{81}{40}\right\}$

19) $\log_5 3 - \log_5 (x+2) = 1$

$\left\{-\frac{7}{5}\right\}$

20) $\log_7 -x + \log_7 9 = 2$

$\left\{-\frac{49}{9}\right\}$

21) $\log_4 (x+9) + \log_4 10 = 3$

$\left\{-\frac{13}{5}\right\}$

22) $\log_5 x + \log_5 (x+6) = \log_5 16$

$\{2\}$

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

23) $13^{-k} + 5 = 40$

-1.3861

24) $2^{-5.4a} - 7 = 64$

-1.1388

25) $3 \cdot 3^{n-2} = 60$

4.7268

26) $5^{x+8} + 7 = 61.9$

-5.5112

27) $8 \cdot 15^{-8n} = 28$

-0.0578

28) $-7 \cdot 15^{4.1m} = -85$

0.2249

Solve each equation.

29) $\log_3 (x+10) - \log_3 6 = 2$

$\{44\}$

30) $\log_8 10 - \log_8 (x-3) = \log_8 48$

$\left\{\frac{77}{24}\right\}$

31) $\log_9 6 - \log_9 -4x = \log_9 61$

$\left\{-\frac{3}{122}\right\}$

32) $\log_6 x - \log_6 (x-4) = 1$

$\left\{\frac{24}{5}\right\}$

33) $\log_4 9 + \log_4 4x = \log_4 53$

$\left\{\frac{53}{36}\right\}$

34) $\log_7 6 - \log_7 (x+5) = 1$

$\left\{-\frac{29}{7}\right\}$