Algebra 2 with support Name_____ ID: 1

Quiz Log properties

Date_____ Period____

Rewrite each equation in exponential form.

1) $\log_9 \frac{1}{81} = -2$

A) $9^{-2} = \frac{1}{81}$ B) $(-2)^9 = \frac{1}{81}$

C) $\left(\frac{1}{81}\right)^9 = -2$ D) $9^{\frac{1}{81}} = -2$

2) $\log_8 \frac{1}{64} = -2$

A) $8^{-2} = \frac{1}{64}$ B) $(-2)^8 = \frac{1}{64}$

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

3) $\log_{\frac{1}{20}} \frac{1}{400} = 2$

A) $\left(\frac{1}{400}\right)^2 = \frac{1}{20}$

B) $\left(\frac{1}{20}\right)^2 = \frac{1}{400}$

C) $\left(\frac{1}{400}\right)^{\frac{1}{20}} = 2$

D) $\left(\frac{1}{20}\right)^{\frac{1}{400}} = 2$

4) $\log_{169} 13 = \frac{1}{2}$

A) $169^{13} = \frac{1}{2}$ B) $169^{\frac{1}{2}} = 13$

C) $\left(\frac{1}{2}\right)^{13} = 169$ D) $\left(\frac{1}{2}\right)^{169} = 13$

5) $\log_{64} \frac{1}{2} = -\frac{1}{6}$

A) $\left(-\frac{1}{6}\right)^{64} = \frac{1}{2}$ B) $64^{-\frac{1}{6}} = \frac{1}{2}$

C) $\left(\frac{1}{2}\right)^{-\frac{1}{6}} = 64$ D) $\left(\frac{1}{2}\right)^{64} = -\frac{1}{6}$

Rewrite each equation in logarithmic form.

6) $14^{-2} = \frac{1}{196}$

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

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

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

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

7) $5^0 = 1$

A) $\log_5 1 = 0$ B) $\log_0 5 = 1$

C) $\log_1 0 = 5$ D) $\log_0 1 = 5$

8) $16^{-2} = \frac{1}{256}$

A) $\log_{\frac{1}{256}} -2 = 16$

B) $\log_{16} \frac{1}{256} = -2$

C) $\log_{16} -2 = \frac{1}{256}$

D) $\log_{-2} 16 = \frac{1}{256}$

9) $13^2 = 169$

A) $\log_{13} 2 = 169$

B) $\log_2 169 = 13$

C) $\log_2 13 = 169$

D) $\log_{13} 169 = 2$

10) $11^1 = 11$

A) $\log_1 11 = 11$

B) $\log_{11} 1 = 9$

C) $\log_{11} 11 = 1$

D) $\log_{11} 1 = 11$

Evaluate each expression.

11) $\log_3 9$

A) 2 B) 3

C) 5 D) –2

12) $\log_3 \frac{1}{27}$

A) 3 B) 4

C) $\frac{1}{81}$ D) –3

13) $\log_4 64$

A) 2 B) 3

C) 16 D) 5

14) $\log_6 36$

A) 2 B) –6

C) 3 D) 6

15) $\log_6 \frac{1}{36}$

A) 2 B) –2

C) $\frac{1}{216}$ D) 3

Expand each logarithm.

16) $\ln \left(\frac{x^2}{y}\right)^6$

A) $\ln z + \frac{\ln x}{3} + \frac{\ln y}{3}$

B) $12 \ln x + 6 \ln y$

C) $12 \ln x - 6 \ln y$

D) $2 \ln z + \frac{\ln x}{3}$

17) $\log_8 \left(\frac{x}{y^4}\right)^3$

A) $3 \log_8 x - 12 \log_8 y$

B) $\frac{\log_8 x}{2} + \frac{\log_8 y}{2} + \frac{\log_8 z}{2}$

C) $\log_8 z + \frac{\log_8 x}{2} + \frac{\log_8 y}{2}$

D) $12 \log_8 x - 3 \log_8 y$

18) $\log_9 \left(a^5 b^5\right)$

A) $25\log_9 a + 5\log_9 b$

B) $5\log_9 a + 5\log_9 b$

C) $25\log_9 a - 5\log_9 b$

D) $\frac{\log_9 a}{3} + \frac{\log_9 b}{3} + \frac{\log_9 c}{3}$

19) $\log_9 \left(uv^4\right)^3$

A) $\frac{\log_9 u}{2} + \frac{\log_9 v}{2} + \frac{\log_9 w}{2}$

B) $\log_9 u + \log_9 v + 4\log_9 w$

C) $3\log_9 u - 12\log_9 v$

D) $3\log_9 u + 12\log_9 v$

20) $\log_8 \left(a^2 b^4\right)$

A) $2\log_8 c + \frac{\log_8 a}{3}$

B) $2\log_8 a + 4\log_8 b$

C) $4\log_8 a - 8\log_8 b$

D) $4\log_8 a + 8\log_8 b$

Condense each expression to a single logarithm.

21) $25\log_5 u + 5\log_5 v$

A) $\log_5 \left(w^5\sqrt{u}\right)$

B) $\log_5 \frac{u^{25}}{v^5}$

C) $\log_5 \left(v^5 u^{25}\right)$

D) $\log_5 \sqrt{wvu}$

22) $30\log u - 6\log v$

A) $\log \left(v^{30} u^6\right)$

B) $\log \left(w^5\sqrt{u}\right)$

C) $\log \frac{u^{30}}{v^6}$

D) $\log \left(v^6 u^{30}\right)$

23) $5\log_7 u - 4\log_7 v$

A) $\log_7 \left(w^5\sqrt{u}\right)$

B) $\log_7 \frac{u^5}{v^4}$

C) $\log_7 \left(v^{20} u^4\right)$

D) $\log_7 \frac{u^4}{v^{20}}$

24) $2\log_4 x + 2\log_4 y$

A) $\log_4 \left(z\sqrt{yx}\right)$

B) $\log_4 \left(y^2 x^2\right)$

C) $\log_4 \sqrt{zyx}$

D) $\log_4 \frac{x^4}{y^2}$

25) $4\log_4 u - 6\log_4 v$

A) $\log_4 \left(vuw^4\right)$

B) $\log_4 \frac{u^4}{v^6}$

C) $\log_4 \left(w\sqrt[3]{vu}\right)$

D) $\log_4 \left(v^6 u^4\right)$