Properties of Logarithms Assignment

Use the properties of logarithms to evaluate expressions:

1. $\log_3 3^7$

4. $\log_6 72 - \log_6 2$

2. $2^{\log_2 5}$

5. $\log_3 9^{15}$

3. $\log 4 + 2\log 5$

6. $\log_7 \frac{1}{7^5}$

Write each logarithmic expression as a single logarithm:

7. $\log_2 7 + \log_2 3$

10. $\log x + \log y$

8. $\frac{1}{2}\log_5 36 - \log_5 3$

11. $\log_x 3xy - 2\log_x \sqrt{y}$

9. $\frac{1}{2}\log_3 25 - \frac{1}{3}\log_3 1000$

12. $3(2\log_7 2)$

Evaluate logarithmic expressions:

13. $\log \sqrt{30} - \log \sqrt{3}$

16. $\log_{0.5} 4 + \log_{\sqrt{5}} 25$

14. $5^{\log_5 10 - 1}$

17. $\log_2 25 \cdot \log_5 \sqrt{2}$

15. $10^{\log\frac{1}{5} - \log 2}$

18. $\log_2 9 \cdot \log_3 4$

Properties of Logarithms Assignment

==Answers:==

Use the properties of logarithms to evaluate expressions:

1. $\log_3 3^7$ ==$= 75$==

2. $2^{\log_2 5}$ ==$= 5$==

3. $\log 4 + 2\log 5 = \log(4 \cdot 5^2) = \log 100$ ==$= 2$==

4. $\log_6 72 - \log_6 2 = \log_6 \frac{72}{2} = \log_6 36$ ==$= 2$==

5. $\log_3 9^{15} = \log_3 3^{2(15)} = \log_3 3^{30}$ ==$= 30$==

6. $\log_7 \frac{1}{7^5} = \log_7 7^{-5}$ ==$= -5$==

Write each logarithmic expression as a single logarithm:

7. $\log_2 7 + \log_2 3 = \log_2 7(3) =$ ==$= \log_2 21$==

8. $\frac{1}{2}\log_5 36 - \log_5 3 = \log_5 36^{1/2} - \log_5 3 = \log_5 \frac{6}{3}$ ==$= \log_5 2$==

9. $\frac{1}{2}\log_3 25 - \frac{1}{3}\log_3 1000 = \log_3 \frac{\sqrt{25}}{\sqrt[3]{1000}} = \log_3 \frac{5}{10}$ ==$= \log_3 \frac{1}{2}$==

10. $\log x + \log y$ ==$= \log xy$==

Exploring Exponential Models Assignment

11. $\log_x 3xy - 2\log_x \sqrt{y} = \log_x \frac{3xy}{y}$ $= \log_x 3x$

12. $3(2\log_7 2) = 6\log_7 2 = \log_7 2^6$ $= \log_7 64$

Evaluate logarithmic expressions:

13. $\log \sqrt{30} - \log \sqrt{3} = \log \frac{\sqrt{30}}{\sqrt{3}} = \log \sqrt{10} = \log 10^{1/2}$ $= \frac{1}{2}$

14. $5^{\log_5 10 - 1} = 5^{\log_5 10 - \log_5 5} = 5^{\log_5 2}$ $= 2$

15. $10^{\log\frac{1}{5} - \log 2} = 10^{\log\frac{1}{10}} = 10^{\log 10^{-1}} = 10^{-1}$ $= \frac{1}{10}$

16. $\log_{0.5} 4 + \log_{\sqrt{5}} 25 = \log_{0.5}(0.5)^{-2} + \log_{\sqrt{5}}(\sqrt{5})^4 = -2 + 4 =$ $= 2$

17. $\log_2 25 \cdot \log_5 \sqrt{2} =$ $= 1$

18. $\log_2 9 \cdot \log_3 4$ $= 4$