

2.12 Logarithmic Function Manipulation

AP Precalculus

Name: _____

CA #2

Instructions: Let x and y be positive constants. Write each as a single logarithm.

1. $3\log_2 x - 5\log_2 y$

2. $2\ln x + \frac{1}{3}\ln y$

3. $\frac{1}{2}(\log x + 5\log y)$

4. $\frac{1}{3}\log_3 x - 6\log_3 y$

Instructions: Let x and y be positive constants. Write each expression as a sum or difference of logarithms.

5. $\ln x^2 y^3$

6. $\log \sqrt{\frac{x^3}{y}}$

7. $\log_7 \sqrt{x^2 y^4}$

8. $\log_5(25x - 50)$

Instructions: Find the domain/range and describe any transformations on the function.

9. $\log_3(9x)$

Domain:

Transformations:

Range:

10. $\log_2(32 - 16x)$

Domain:

Transformations:

Range:

Answers

1. $\log_2 \frac{x^3}{y^5}$
2. $\ln x^2 \sqrt[3]{x}$
3. $\log \sqrt{xy^5}$
4. $\log_3 \frac{\sqrt[3]{x}}{y^6}$
5. $2 \ln x + 3 \ln y$
6. $\frac{1}{2}(3 \log x - \log y)$
7. $\frac{1}{2}(2 \log_7 x + 4 \log_7 y)$
8. $2 + \log_5(x - 2)$
9. Domain: $(0, \infty)$ Range: $(-\infty, \infty)$ Transformations: Vertical translation up 2.
10. Domain: $(-\infty, 2)$ Range: $(-\infty, \infty)$ Transformations: Vertical translation up 4. Horizontal reflection.