Name _____ Date _____
Mr. Schlansky Algebra II

Logarithm Rules Given Multiple Logarithms

Evaluate each of the following:

1. $\log_3 54 - \log_3 2$

2. $\log_8 30 - \log_8 2$

3. $3\log x + 5\log y$

4. $\log_5 20 - \log_5 4 + \log_5 y$

5. $\log_2 16 - \log_2 2$

6. $\log_6 25 - \log_6 5$

7. $2\log x - 3\log y$

8. $\log_4 60 - \log_4 4 + \log_4 x$

9. The expression $\frac{1}{2}\log m - 3\log n$ is equivalent to

(1) $\log\sqrt{m} + \log n^3$

(2) $\log\frac{1}{2}m - 3\log n$

(3) $\log\frac{m^2}{3\sqrt{n}}$

(4) $\log\frac{\sqrt{m}}{n^3}$

10. If $\log x = 2\log a + \log b$, then x equals

1) $a^2 b$
2) $2ab$
3) $a^2 + b$
4) $2a + b$

11. If $\log x^2 - \log 2a = \log 3a$, then $\log x$ expressed in terms of $\log a$ is equivalent to

1) $\frac{1}{2}\log 5a$
2) $\frac{1}{2}\log 6 + \log a$
3) $\log 6 + \log a$
4) $\log 6 + 2\log a$

12. If $\log_b x = 3\log_b p - \left(2\log_b t + \frac{1}{2}\log_b r\right)$, then the value of x is

1) $\frac{p^3}{\sqrt{t^2 r}}$
2) $p^3 t^2 r^{\frac{1}{2}}$
3) $\frac{p^3 t^2}{\sqrt{r}}$
4) $\frac{p^3}{t^2\sqrt{r}}$

13. The expression $2\log x - (3\log y + \log z)$ is equivalent to

1) $\log \frac{x^2}{y^3 z}$
2) $\log \frac{x^2 z}{y^3}$
3) $\log \frac{2x}{3yz}$
4) $\log \frac{2xz}{3y}$