Logarithm property practice

Name: _____ **Date:** _____

1. The expression $log12$ is equivalent to

   A. $log6 + log6$ B. $log3 + 2log2$

   C. $log3 - 2log2$ D. $log3 \bullet log4$

2. The expression $\log 4x$ is equivalent to

   A. $\log x^4$ B. $4 \log x$

   C. $\log 4 + \log x$ D. $(\log 4)(\log x)$

3. The expression $\log \frac{xy}{w}$ is equivalent to

   A. $\frac{2 \log xy}{\log w}$

   B. $\log x + \log y - \log w$

   C. $\frac{1}{2}(\log x + \log y) - \log w$

   D. $\frac{1}{2}(\log xy - \log w)$

4. The expression $\frac{1}{2} \log a - 2 \log b$ is equivalent to

   A. $\log \frac{\sqrt{a}}{b^2}$ B. $\log \sqrt{ab}$

   C. $\log \frac{a^2}{\sqrt{b}}$ D. $\log(\sqrt{a} - b^2)$

5. If $x = u^2v$, which expression is equivalent to $\log x$?

   A. $2 \log u + \log v$ B. $\log 2u + \log v$

   C. $\frac{2 \log u}{\log v}$ D. $2 \log u \log v$

6. $\log \frac{\sqrt{xy}}{z}$ is equal to

   A. $\frac{1}{2} \log x + \frac{1}{2} \log y - \log z$

   B. $\frac{1}{2} \log x + \log y - \log z$

   C. $\frac{1}{2}(\log x + \log y - \log z)$

   D. $\frac{\frac{1}{2} \log xy}{\log z}$

7. The expression $\log \dfrac{\sqrt[3]{a}}{b}$ is equivalent to

A. $\frac{1}{3}\log a - \log b$ B. $\frac{1}{3}\log(a-b)$

C. $3\log a - \log b$ D. $3\log(a-b)$

8. If $x = (8^2)(\sqrt{5})$, which expression is equivalent to $\log x$?

A. $2\log 8 + 2\log 5$ B. $2(\log 8 + \frac{1}{2}\log 5)$

C. $2\log 8 + \frac{1}{2}\log 5$ D. $(2\log 8)(\frac{1}{3}\log 5)$

9. If $x = \dfrac{\sqrt{r}}{s}$, which expression is equivalent to $\log x$?

A. $\dfrac{2\log r}{\log s}$ B. $2\log r - \log s$

C. $\frac{1}{2}\log r - \log s$ D. $\dfrac{\log r - \log s}{2}$

10. $\text{Log}\, \dfrac{\sqrt{b}}{a^2}$ is equivalent to

A. $\frac{1}{2}\log b + 2\log a$ B. $\frac{1}{2}\log b - 2\log a$

C. $2\log b - \frac{1}{2}\log a$ D. $\dfrac{\frac{1}{2}\log b}{2\log a}$

11. What is a logarithmic equation for the formula $t = \pi\sqrt{\dfrac{\ell}{g}}$?

A. $\log t = \dfrac{\log \pi + \log \ell - \log g}{2}$

B. $\log t = \log \pi + \frac{1}{2}(\log \ell - \log g)$

C. $\log t = \log \pi + 2(\log \ell - \log g)$

D. $\log t = \log \pi + \frac{1}{2}\log \ell - \log g$

12. The expression $\log a + \frac{1}{2}\log b$ is equivalent to

A. $\log \sqrt{ab}$ B. $\log a\sqrt{b}$

C. $\log(a + \sqrt{b})$ D. $(\log a)\left(\frac{1}{2}\log b\right)$

13. If $x = 4ab^2$, which expression is equivalent to $\log x$?

A. $\log 8 + \log a + \log b$

B. $2(\log 4 + \log a + \log b)$

C. $\log 8ab$

D. $\log 4 + \log a + 2\log b$

14. If $u = \dfrac{x}{y^2}$, which expression is equivalent to $\log u$?

A. $\log x + 2\log y$ B. $2(\log x - \log y)$

C. $2(\log x + \log y)$ D. $\log x - 2\log y$

15. If $A = \pi r^2$, then $\log A$ is equivalent to

A. $2(\log \pi + \log r)$ B. $\log \pi + 2\log r$

C. $\log \pi + \frac{1}{2}\log r$ D. $(\log \pi)(\log r^2)$

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

A. $\log\left(\frac{1}{3}m - 2n\right)$ B. $\log\left(\dfrac{m^3}{\sqrt{n}}\right)$

C. $\log\left(\sqrt[3]{m} - n^2\right)$ D. $\log\left(\dfrac{\sqrt[3]{m}}{n^2}\right)$

17. Log $\sqrt{\dfrac{a}{b}}$ is equivalent to

A. $\frac{1}{2}\log a - \log b$ B. $\frac{1}{2}(\log a - \log b)$

C. $\frac{1}{2}(\log a + \log b)$ D. $\frac{1}{2}\log a + \log b$

18. If $2x^3 = y$, then $\log y$ equals

A. $\log(2x) + \log 3$ B. $3\log(2x)$

C. $3\log 2 + 3\log x$ D. $\log 2 + 3\log x$

19. The expression $\log 4m^2$ is equivalent to

A. $2(\log 4 + \log m)$ B. $2\log 4 + \log m$

C. $\log 4 + 2\log m$ D. $\log 16 + 2\log m$

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

A. $\log \dfrac{x^2}{y^3 z}$ B. $\log \dfrac{x^2 z}{y^3}$

C. $\log \dfrac{2x}{3yz}$ D. $\log \dfrac{2xz}{3y}$