

F.BF.B.5: Properties of Logarithms 2a

1 The expression $2 \log_5 m + \log_5 n$ is equivalent to

- 1) $\log_5 m^2 n$
- 2) $\log_5 \frac{m^2}{n}$
- 3) $\log_5 \sqrt{mn}$
- 4) $\log_5 \frac{2m}{n}$

2 The expression $2 \log x - 3 \log y$ is equivalent to

- 1) $\log \frac{2x}{3y}$
- 2) $\log x^2 y^3$
- 3) $\log \frac{x^2}{y^3}$
- 4) $\frac{2}{3} \log \frac{x}{y}$

3 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) $\log \frac{2xz}{3y}$

4 The expression $\log 10^{x+2} - \log 10^x$ is equivalent to

- 1) -2
- 2) 2
- 3) 100
- 4) $\frac{1}{100}$

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

6 The expression $\frac{1}{3} \log a - 3 \log b$ is equivalent to

- 1) $\log(\sqrt[3]{a} - b^3)$
- 2) $\log \frac{a}{3b^3}$
- 3) $\log \frac{\sqrt[3]{a}}{b^3}$
- 4) $\log \frac{\sqrt[3]{a}}{3b}$

7 The expression $3 \log x - \frac{1}{2} \log y$ is equal to

- 1) $\log \frac{x^3}{y^2}$
- 2) $\log \frac{x^3}{\sqrt{y}}$
- 3) $\log \sqrt{\frac{3x}{y}}$
- 4) $\frac{\log 3x}{\frac{1}{2} \log y}$

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

- 1) $\log \frac{\sqrt{a}}{b^2}$
- 2) $\log \sqrt{ab}$
- 3) $\log \frac{a^2}{\sqrt{b}}$
- 4) $\log(\sqrt{a} - b^2)$

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

- 1) $\log\left(\frac{1}{3}m - 2n\right)$
- 2) $\log\left(\frac{m^3}{\sqrt{n}}\right)$
- 3) $\log(\sqrt[3]{m} - n^2)$
- 4) $\log \frac{\sqrt[3]{m}}{n^2}$

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 $\log k = c \log v + \log p$, k equals

- 1) $v^c p$
- 2) $(vp)^c$
- 3) $v^c + p$
- 4) $cv + p$

12 If $\log x = 3 \log a - \log b$, then x is equal to

- 1) $\frac{3a}{b}$
- 2) $\frac{a^3}{b}$
- 3) $3a - b$
- 4) $a^3 - b$

13 If $\log x = \log a - 3 \log b$, x is equal to

- 1) $a - 3b$
- 2) $a - b^3$
- 3) $\frac{a}{3b}$
- 4) $\frac{a}{b^3}$

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

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Answer Section

- 1 ANS: 1 REF: 068423siii
 2 ANS: 3 REF: 080226siii
 3 ANS: 1

$$2 \log x - (3 \log y + \log z) = \log x^2 - \log y^3 - \log z = \log \frac{x^2}{y^3 z}$$

REF: 061010a2

- 4 ANS: 2

$$\log 10^{t+2} - \log 10^t = \frac{\log 10^{t+2}}{\log 10^t} = \log 10^2 = 2$$

REF: 010316b

- 5 ANS: 4 REF: 080809b
 6 ANS: 3 REF: 018431siii
 7 ANS: 2 REF: 088528siii
 8 ANS: 1 REF: 018920siii
 9 ANS: 4 REF: 019529siii
 10 ANS: 1

$$\log x = \log a^2 + \log b$$

$$\log x = \log a^2 b$$

$$x = a^2 b$$

REF: 061517a2

- 11 ANS: 1
 $\log k = c \log v + \log p$
 $\log k = \log v^c + \log p$
 $\log k = \log v^c p$
 $k = v^c p$

REF: 080212b

- 12 ANS: 2 REF: 011014b
 13 ANS: 4 REF: 010333siii
 14 ANS: 4 REF: 061207a2