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

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

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

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

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