MAC1105 College Algebra
4.3: Properties of logarithms Practice 15

Use properties of logarithms to expand the logarithmic expression as much as possible.

1) $\log_3 (27x)$ 1) _____

A) $9 + \log_3 x$ B) $3 + \log_3 x$ C) $3x$ D) $3 \log_3 x$

2) $\ln\left(\frac{e^5}{6}\right)$

3) $\log_c x^4$ 3) _____

A) $-4\log_c x$ B) $c\log_4 x$ C) $-c\log_4 x$ D) $4\log_c x$

4) $\ln \sqrt[8]{x}$ 4) _____

A) $8\ln x$ B) $\frac{1}{8}\ln x$ C) $x \ln 8$ D) $8\ln \sqrt{x}$

5) $\log_5 \sqrt[4]{y}$

Use properties of logarithms to expand the logarithmic expression as much as possible.

6) $\log_b (yz^8)$

7) $\log_b\left(\frac{xy^5}{z^9}\right)$

8) $\log_{17}\left(\frac{\sqrt[2]{5}}{y^2x}\right)$

Use properties of logarithms to condense the logarithmic expression.

9) $5\log_b y + 8\log_b z$ 9) _____

A) $\log_b y^5z^8$ B) $40\log_b yz$ C) $\log_b (yz)^{13}$ D) $13\log_b yz$

10) $3\ln (x - 6) - 10 \ln x$ 10) _____

A) $\ln \frac{(x - 6)^3}{x^{10}}$ B) $\ln \frac{3(x - 6)}{10x}$ C) $\ln 30x(x - 6)$ D) $\ln x^{10}(x - 6)^3$

Use common logarithms or natural logarithms and a calculator to evaluate to four decimal places

11) $\log_8 20$

Answer Key
Testname: PRACTICE15

1) B
2) 5 - ln 6
3) D
4) B
5) $\frac{1}{4}\log_5 y$
6) $\log_b y + 8\log_b z$
7) $\log_b x + 5\log_b y - 9\log_b z$
8) $\frac{1}{2}\log_{17} 5 - 2\log_{17} y - \log_{17} x$
9) A
10) A
11) 1.4406