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7 ❦ Logarithms

Student ID No.											Name
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1 Find each of the following values.

a) $\log_3 9 =$

b) $\log_2 16 =$

c) $\log_4 8 =$

d) $\log_{\frac{1}{2}} 16 =$

e) $\log_{10} 0.1 =$

f) $\log_9 \sqrt{3} =$

g) $\log_2 \sqrt[3]{2} =$

h) $\log_{\sqrt{5}} 25 =$

i) $\log_{16} \frac{1}{64} =$

2 Solve each of the following equations for x

a) $\log_2 x = 3$

b) $\log_9 x = \frac{3}{2}$

c) $\log_2 x = -2$

d) $\log_x 27 = 3$

3 Simplify the following.

a) $\log_2 4 + \log_4 8 =$

b) $\log_3 2 - \log_3 18 =$

c) $\log_3 4 + \log_3 18 - 3\log_3 2 =$

d) $\log_2 \sqrt[3]{12} - \frac{1}{3}\log_2 3 =$

4 Let $p = \log_a 2$ and $q = \log_a 3$. Express each of the following in terms of p and q.

a) $\log_a 72 =$

b) $\log_a \frac{3}{8} =$

c) $\log_a \sqrt[3]{6} =$

5 Simplify the following using the change-of-base formula.

a) $\log_4 8 =$

b) $\log_9 3 =$

c) $\log_3 2 \cdot \log_2 27 =$

6 Simplify the following.

a) $\frac{1}{2}\log_5 3 + 3\log_5 \sqrt{2} - \log_5 \sqrt{24} =$

b) $(\log_2 3 + \log_4 9)(\log_3 4 + \log_9 2) =$