Logarithmic Functions

1. Write each equation in its equivalent exponential form.
(similar to p.434 #4)

$$5 = \log_3 x$$

2. Write each equation in its equivalent logarithmic form.
(similar to p.434 #10)

$$5^3 = 125$$

3. Write each equation in its equivalent logarithmic form.
(similar to p.434 #14)

$$\sqrt[4]{16} = 2$$

4. Evaluate each expression without using a calculator
(similar to p.434 #22)

$$\log_5 25$$

5. Evaluate each expression without using a calculator
(similar to p.434 #28)

$$\log_2 \frac{1}{8}$$

6. Evaluate each expression without using a calculator (similar to p.434 #30)

$$\log_4 \sqrt{4}$$

7. Evaluate each expression without using a calculator (similar to p.434 #34)
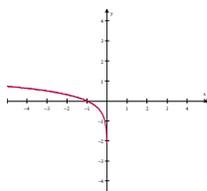
$$\log_9 3$$

8. Evaluate each expression without using a calculator (similar to p.434 #38)

$$\log_8 1$$

9. Evaluate each expression without using a calculator (similar to p.434 #42)

$$3^{\log_3 17}$$

10. The graph of an exponential function is given. Select the function for each graph from the following options: (similar to p.434 #47-52)

$$f(x) = \log_9(x)$$
$$g(x) = \log_9(x-1)$$
$$h(x) = \log_9(-x)$$
$$i(x) = \log_9(-x-1)$$
$$j(x) = -\log_9(x)$$
$$k(x) = -\log_9(-x)$$

11. Describe the transformation and graph the function (similar to p.435 #54)

$$f(x) = \log_4(x-3)$$

12. Describe the transformation
and graph the function
(similar to p.435 #62)

$$f(x) = \log x + 3$$

13. Describe the transformation
and graph the function
(similar to p.435 #68)

$$f(x) = \ln\left(\frac{1}{3}x\right)$$

14. Find the domain of each
logarithmic function
(similar to p.435 #76)

$$f(x) = \log_3(x - 5)$$

15. Find the domain of each
logarithmic function
(similar to p.435 #80)

$$f(x) = \ln(x + 3)^2$$

16. Evaluate or simplify each
expression without using a calculator
(similar to p.435 #82)

$$\log 10000$$

17. Evaluate or simplify each
expression without using a calculator
(similar to p.435 #92)

$$\ln \frac{1}{e^3}$$

18. Evaluate or simplify each expression without using a calculator (similar to p.435 #98)

$$e^{\ln 9x}$$

19. Evaluate or simplify each expression without using a calculator (similar to p.435 #100)

$$10^{\log(5x-2)}$$