

## Chapter 3 Test

Find the inverse of each function below.

1)  $f(x) = x^2 - 7, x \geq 0$

2)  $f(x) = 5x + 3$

3)  $y = \frac{3x - 5}{x + 7}$

4)  $y = 3^x$

5) Show that  $f(x)$  is the inverse of  $g(x)$  below.

$$f(x) = 5x + 7 \quad g(x) = \frac{x - 7}{5}$$

Evaluate.

6)  $\log_9\left(\frac{1}{3}\right)$

7)  $\log_7 343$

8)  $\ln \sqrt{e}$

9)  $\log 100000000$

10)  $\log_3 81$

11)  $\log_{1/2} 4$

Write each expression as a single logarithm.

$$12) 5\log_2 x^3 + \frac{1}{2}\log_2(x+3)$$

$$13) 3\ln(x) - 4\ln(x+5) + \ln(x+5)$$

Write as a sum of logarithms.

$$14) \log \left[ \frac{x^3(x+6)}{(x-7)(x-1)} \right]$$

$$15) \text{ Find the domain of } f(x) = \ln(x^2 - 9)$$

Graph the following functions. State any asymptotes.

$$16) y = -\log_3(x) + 2$$

$$17) y = e^x + 2$$

Solve for  $x$ .

$$19) 5^{1-3x} = 25$$

$$20) e^{1-4x} = 6$$

$$21) 3^{x+2} = 7^{x-1}$$

$$22) \log_4(x-5) + \log_4(x+5) = 3$$

$$23) 4\ln(x-1)^2 = 32, \text{ over } (1, \infty)$$