

Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

1. The domain of a logarithmic function  $f(x) = \log_a x$  is \_\_\_\_\_.2. The graph of every logarithmic function  $f(x) = \log_a x$ , where  $a > 0$ , and  $a \neq 1$ , passes through three points:

\_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.

3. **True or False:** If  $y = \log_a x$ , then  $y = a^x$ .4. **True or False:** The graph of  $f(x) = \log_a x$ , where  $a > 0$ , and  $a \neq 1$ , has an x-intercept equal to 1 and no y-intercept.**Change each exponential statement into an equivalent statement involving a logarithm.**

5.  $9 = 3^2$

6.  $3^{(-3)} = \frac{1}{27}$

7.  $3^x = 4.6$

8.  $e^{2.2} = M$

**Change each logarithmic statement to an equivalent statement involving an exponent.**

9.  $\log_2 8 = 3$

10.  $\log_8 4 = \frac{2}{3}$

11.  $\log_2 6 = x$

12.  $\ln x = 4$

**Find the exact value of each logarithm without using a calculator. Show your work!**

13.  $\log_2 1 = x$

14.  $\log_4 16 = x$

15.  $\log_2 8 = x$

16.  $\ln \sqrt{e} = x$

Use a calculator to evaluate each expression. Do not round until the end of the problem. Round your final answer to the nearest ten-thousandths.

17.  $\log 9.43$

18.  $\log(-14)$

19.  $\ln 4.05$

20.  $\ln(-0.49)$

21.  $\frac{\ln 5}{3}$

22.  $\frac{\ln 4 + \ln 2}{\log 4 + \log 2}$

23.  $\frac{2\ln 5 + \log 50}{\log 4 - \ln 2}$

Find the domain of each function. Write the answers in interval notation. SHOW WORK!

24.  $f(x) = \ln(x-3)$

25.  $f(x) = 3 - 2\log_4 \left[ \frac{x}{2} - 5 \right]$

26.  $g(x) = \log_5 \left( \frac{2}{3}x + 8 \right)$

27.  $g(x) = \ln(-x-2)$

Use the given function  $f$  to:

(a) Find the domain of  $f$  and any asymptotes of  $f$ . (b) Write the transformations. (c) Graph  $f$ . (d) From the graph determine the range.

Use transformations and a table of values for at least 3 key points to get the graphs. **No graphing calculators!**

28.  $f(x) = \ln(x+4)$

Domain: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

Key points and transformations:

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |

Range: \_\_\_\_\_

29.  $f(x) = \log(-x) + 3$

Domain: \_\_\_\_\_

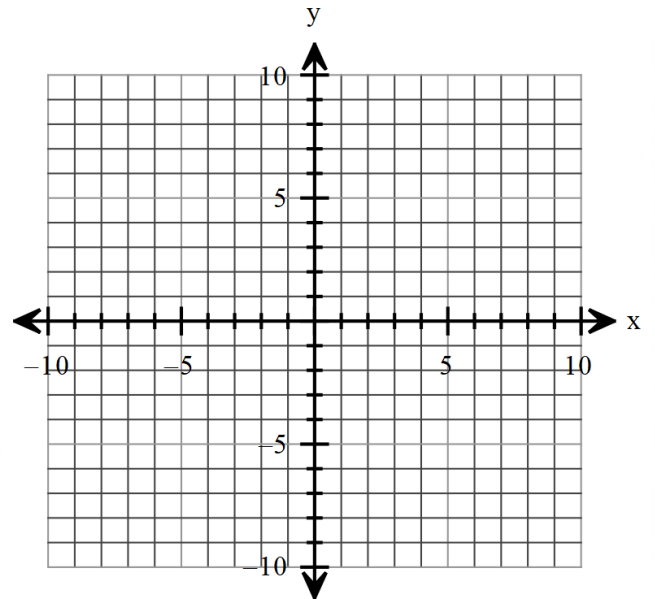
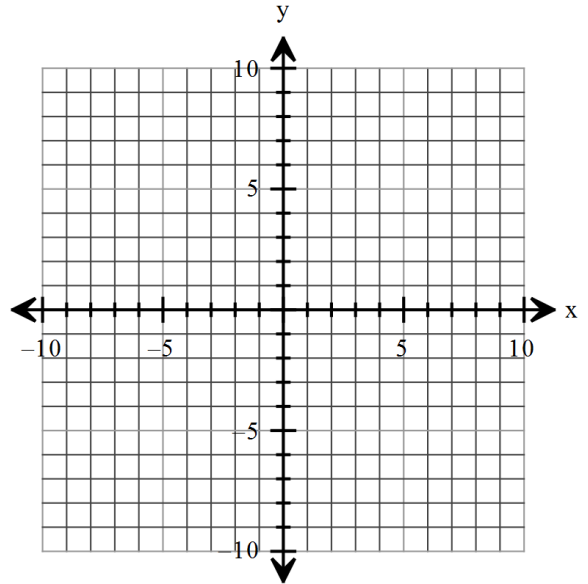
Asymptotes: \_\_\_\_\_

Key points and transformations:

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |

Range: \_\_\_\_\_



30.  $f(x) = \ln[-(x+2)]$

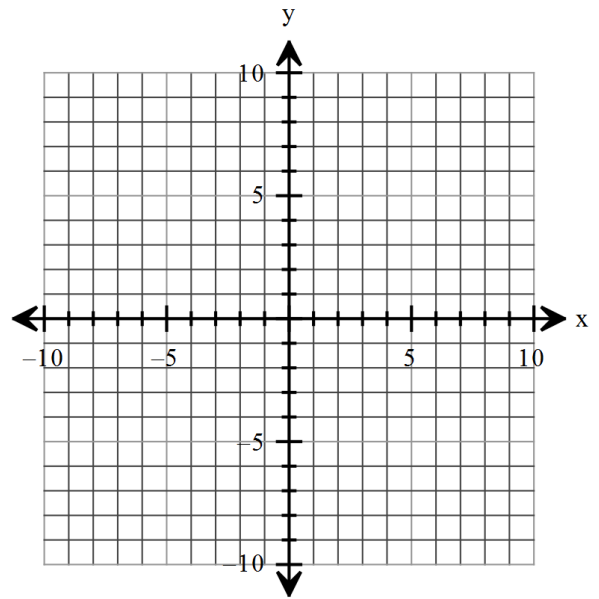
Domain: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

Key points and transformations:

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |
|     |        |

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |
|     |        |



Range: \_\_\_\_\_

31.  $f(x) = -\ln(x)$

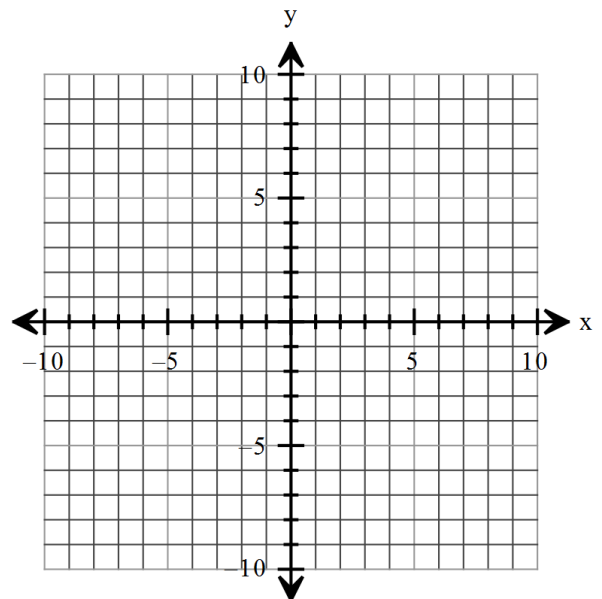
Domain: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

Key points and transformations:

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |
|     |        |

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |
|     |        |



Range: \_\_\_\_\_

32.  $f(x) = -2\log_3(x-5)$

Domain: \_\_\_\_\_

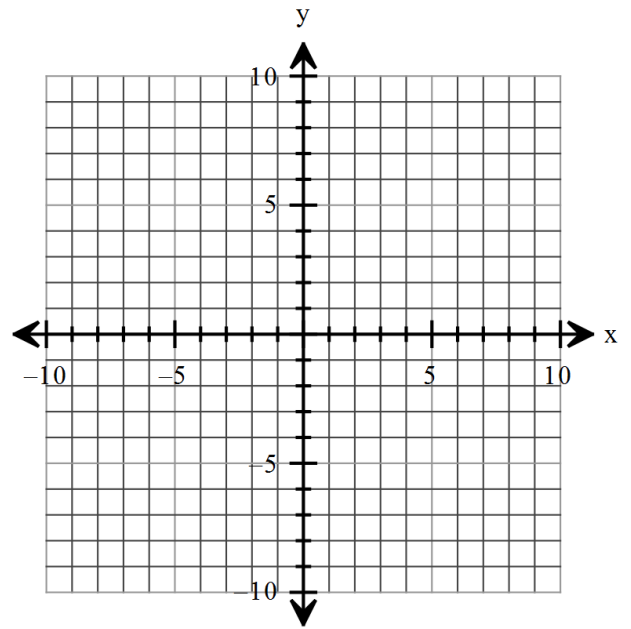
Asymptotes: \_\_\_\_\_

Key points and transformations:

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |

Range: \_\_\_\_\_



33.  $f(x) = \log_3(x-4) + 2$

Domain: \_\_\_\_\_

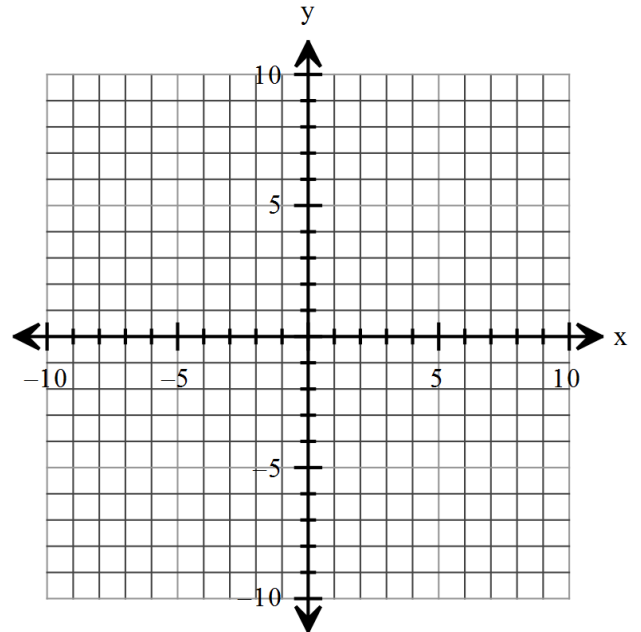
Asymptotes: \_\_\_\_\_

Key points and transformations:

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |

Range: \_\_\_\_\_



34.  $f(x) = 3\log_2(-x)$

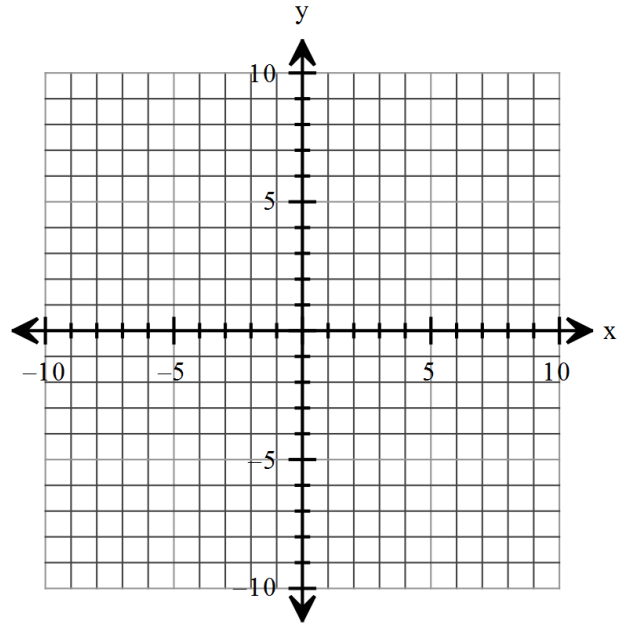
Domain: \_\_\_\_\_

Asymptotes: \_\_\_\_\_

Key points and transformations:

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |
|     |        |

| $x$ | $f(x)$ |
|-----|--------|
|     |        |
|     |        |
|     |        |
|     |        |



Range: \_\_\_\_\_