

Name \_\_\_\_\_ Block \_\_\_\_\_

Write the logarithmic form.

1)  $5^{-1} = \frac{1}{5}$

2)  $4^2 = 16$

3)  $\sqrt{9} = 3$

4)  $3^0 = 1$

Write in exponential form.

5)  $\log_2 8 = 3$

6)  $\log_6 6 = 1$

7)  $\log_8 2 = \frac{1}{3}$

8)  $\log_3 \frac{1}{27} = -3$

Evaluate without a calculator.

9)  $\log_3 9$

10)  $\log_2 32$

11)  $\log_4 1$

12)  $\log_{25} 5$

Simplify.

13)  $7^{\log_7 x}$

14)  $\log_3 3^x$

15)  $4^{\log_4 3x}$

16)  $\log_5 5^{x-2}$

Find the inverse.

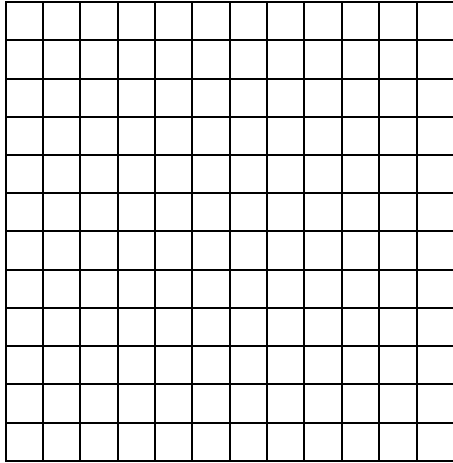
17)  $f(x) = \log_5 x$

18)  $f(x) = \ln 2x$

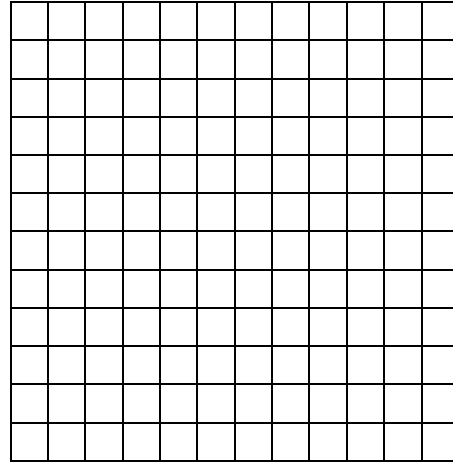
19)  $f(x) = \log_{\frac{1}{2}} x$

20)  $f(x) = \log(x - 3)$

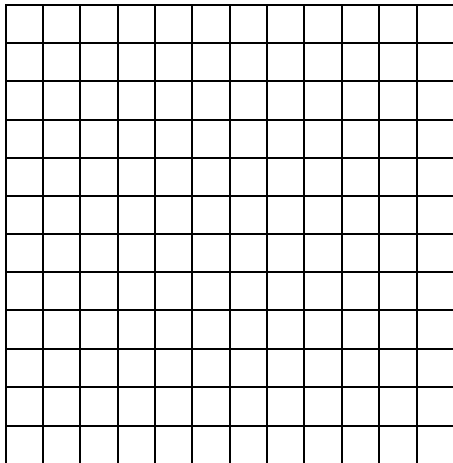
Graph.



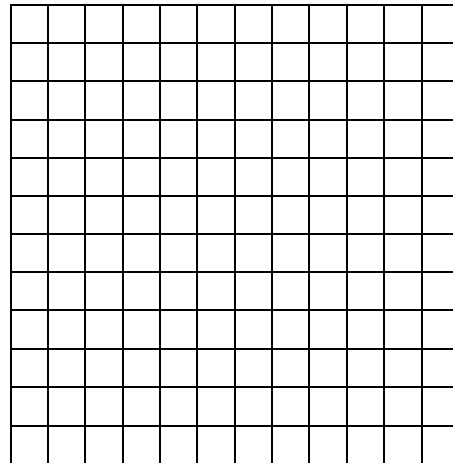
21)  $y = \left(\frac{2}{3}\right)^x$



22)  $y = 3^x - 2$



23)  $y = \ln x$



24)  $y = \log_2(x + 1)$

Expand.

25)  $\log_2(3x^2)$

26)  $\log_2 3x^3y^2$

27)  $\log_3 \frac{5}{x^2}$

28)  $\log_5 \frac{2x^4}{\sqrt{y}}$

Condense.

29)  $3\log_2 x + \log_2 7$

30)  $\frac{1}{2}\ln x - \ln 3$

31)  $\log_4 5 + \log_4 x + 7\log_4 y$

32)  $\log 3 + 2\log x - \log 7$

Use change of base to evaluate. Round to two decimals.

33)  $\log_2 5$

34)  $\log_7 10$

35)  $\log_6 200$

36)  $\log_5 \frac{1}{2}$

Solve the equation.

37)  $e^{3x} = e^{2x+7}$

38)  $3^{2x-10} = \frac{1}{9}$

39)  $5^x - 2 = 14$

40)  $2e^{4x} = 20$

41)  $\log_2 x = 5$

42)  $\ln(5x - 3) = 2$

43)  $7 + \log x = 4$

44)  $\ln(2x + 3) = \ln(4x - 1)$

Simplify.

45)  $(e^4)^{-2}$

46)  $-3e \cdot 4e^2$

47)  $e^{2x} \cdot e^{1-2x}$

48)  $\sqrt{64e^{4x}}$

49)  $\frac{e}{e^x + 1}$

50)  $\left(\frac{e^2}{2}\right)^{-3}$

51) In 1996 tuition for a private college was \$15,000. Since then, the cost has gone up 7% per year. Write the model for tuition increase for 10 years.

52) In 1991 the number of computers per 100 people was 25.2. If computer ownership increased 15% per year over the next 5 years, write the model.

53) If you cut a 16ft board in half, then cut those pieces in  $\frac{1}{2}$ , and continue cutting the pieces in half, write the model for how long the pieces will be after 6 rounds of cuts.

54) A business spends \$250,000 on equipment that depreciates at a rate of 12% per year. Write the model for the value of the equipment after 5 years.