# 4.3 WS

**Write each equation in its exponential form.**

1. $2 = \log_8 64$

2. $2 = \log 100$

3. $\log_5 125 = 3$

4. $\ln x = 7$

**Write each equation in its logarithmic form. Assume $y > 0$ and $b > 0$.**

5. $7^2 = 49$

6. $y = e^x$

7. $4^3 = 64$

8. $e^5 = 3x + 1$

**Evaluate each logarithmic expression. Do not use a calculator.**
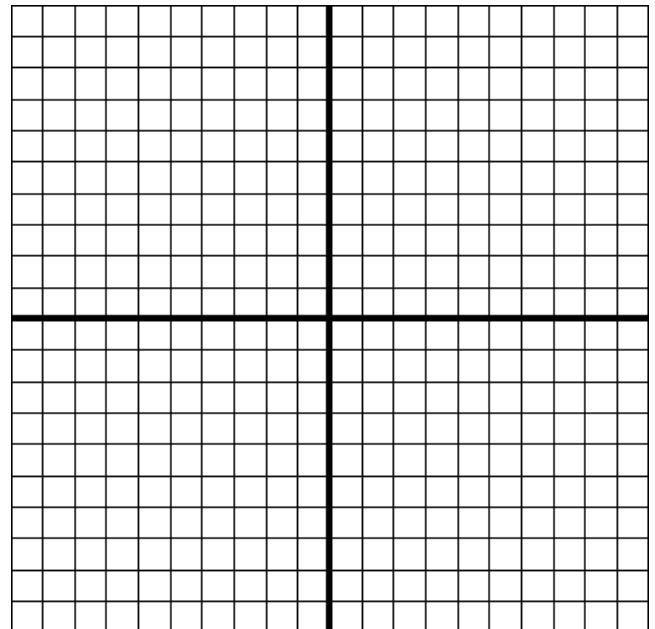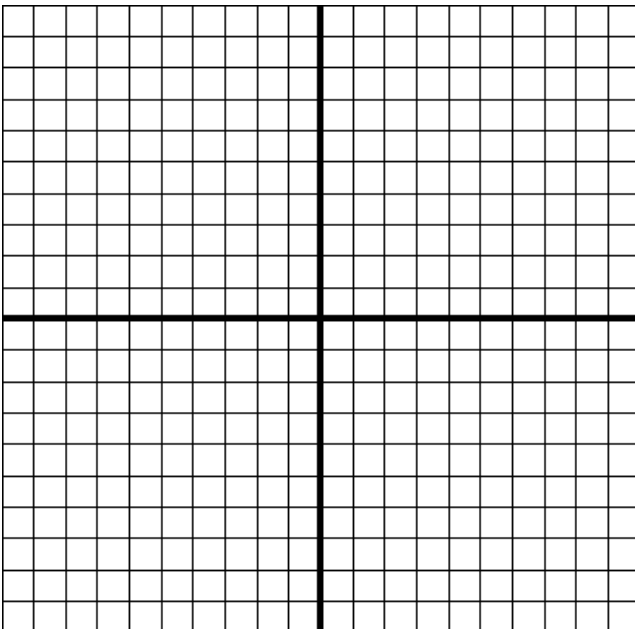
9. $\log_4 16$

10. $\log_3 3$

11. $\log_6 1296$

12. $\log_3 \dfrac{1}{243}$

**Graph each function by using it exponential form.**

13. $f(x) = \log_6 x$

14. $f(x) = \log_{1/4} x$

**Find the domain of the function.**

15. $k(x) = \log_{2/3}(11 - x)$   16. $f(x) = \ln(x^2 - 4)$   17. $h(x) = \log_2\left(\dfrac{x}{x+5}\right)$   18. $g(x) = \log_7\left(\dfrac{x+2}{x^2}\right)$

**Explain how to use the graph of the first function to produce the graph of the second function.**

19. $f(x) = \log_4 x;\ f(x) = \log_4 x + 5$

20. $f(x) = \log_8 x;\ f(x) = \log_8(x+1)$

21. $f(x) = \log_{2/3} x;\ f(x) = \log_{2/3}(x-3) - 2$

22. The function $r(t) = 0.69607 + 0.60781 \ln t$ gives the annual interest rate $r$, as a percent, a bank will pay on its money market accounts, where $t$ is the term (the time the money is invested) in months.
   a. What interest rate, to the nearest tenth of percent, will the bank pay on a money market account with a term of 9 months?

   b. What is the minimum number of complete months during which a person must invest to receive an interest rate of at least 3%?