4.3 WS 2

Write each equation in its exponential form.

1. $3 = \log_4 64$
2. $\log_{12} 144 = 2$
3. $3 = \log 1000$
4. $\ln x = 5$

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

5. $14^2 = 196$
6. $7^3 = 343$
7. $20.09 = e^3$
8. $e^7 = x + 3$

Evaluate each logarithmic expression. Do not use a calculator.
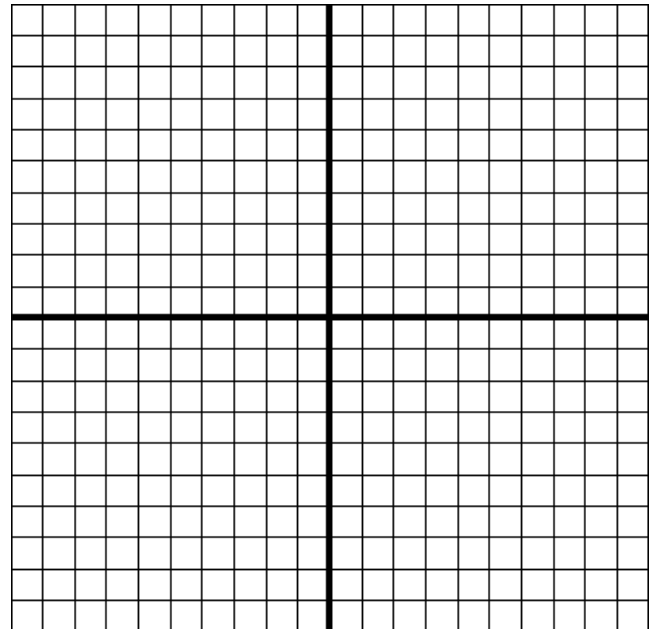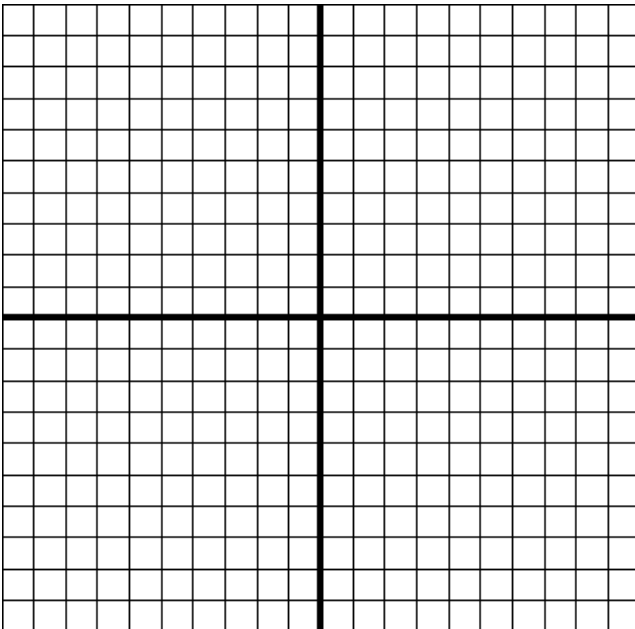
9. $\log_4 1$
10. $3\log_{1/2} 32$
11. $2\left(5^{\log_5 125}\right)$
12. $\log_{12} 1728$

Graph each function by using it exponential form.

13. $f(x) = \log_{1/2} x$

14. $f(x) = \log_2 x$

Find the domain of the function.

15. $k(x) = \log_7(x+7)$ 16. $f(x) = \log(x^2 + 3x - 10)$ 17. $h(x) = \log_2 x$ 18. $g(x) = \log_7\left(\dfrac{2}{x-3}\right)$

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

19. $f(x) = \log_4 x;\ f(x) = \log_4(x-3) - 3$

20. $f(x) = \log_8 x;\ f(x) = \log_8 x + 9$

21. $f(x) = \log_{2/3} x;\ f(x) = \log_{2/3}(x+7)$

22. The following function models the average typing speed S, in words per minute, of a student who has been typing for t months.

$$S(t) = 5 + 29\ln(t+1),\ \ 0 \le t \le 16$$

    a. What was the student's average typing speed, to the nearest word per minute, when the student first started to type? What was the student's average typing speed, to the nearest word per minute, after 3 months?

    b. Determine how long, to the nearest tenth of a month, it will take the student to achieve an average typing speed of 65 words per minute.