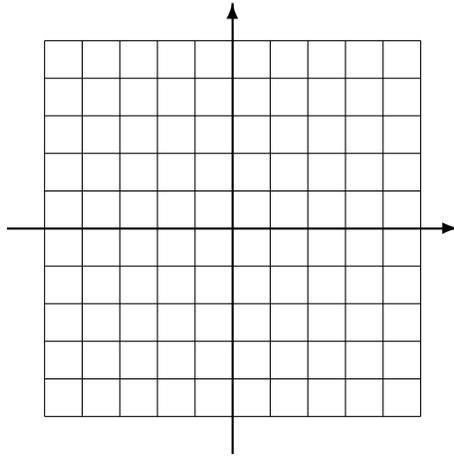
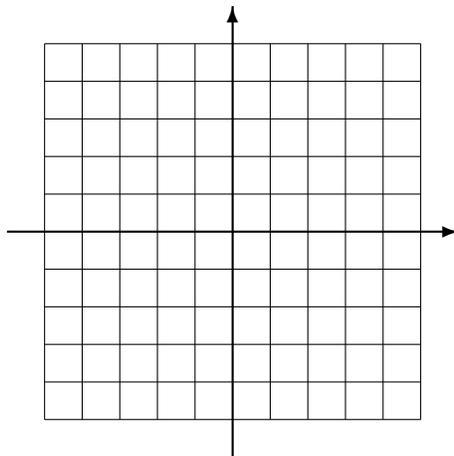


8. Determine four points on the graph of $f(x) = 2^x$. Then plot your points and carefully sketch the graph. Indicate any asymptotes.



9. Determine four points on the graph of $g(x) = \left(\frac{1}{2}\right)^x$. Then plot your points and carefully sketch the graph. Indicate any asymptotes.



10. Determine the horizontal asymptote of the graph of $y = e^{x-2} - 3$.

11. Determine the horizontal asymptote of the graph of $y = \left(\frac{2}{7}\right)^{x+4} + 9$.

12. Determine the y -intercept of the graph of $y = 5^{x+1} + 8$.

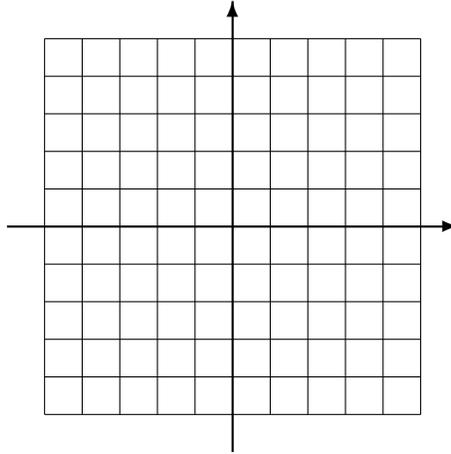
13. Rewrite as an exponential equation: $\log_7 49 = 2$

14. Rewrite as an exponential equation: $\log_{1/2} 64 = -6$

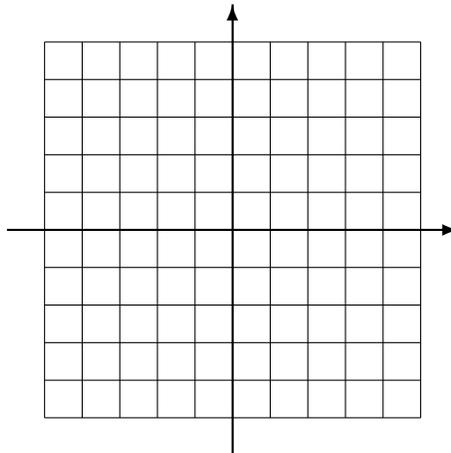
15. Rewrite as a logarithmic equation: $3^6 = 729$

16. Rewrite as a logarithmic equation: $2^{-5} = \frac{1}{32}$

17. Determine four points on the graph of $f(x) = \log_2 x$. Then plot your points and carefully sketch the graph. Indicate any asymptotes.



18. Determine four points on the graph of $g(x) = \ln x$. Then plot your points and carefully sketch the graph. Indicate any asymptotes.



19. Explain how the graph of $y = 3 + \ln(x - 4)$ can be obtained from the graph of $y = \ln x$.

20. Determine the vertical asymptote of the graph of $y = \ln(x - 3)$.

21. Determine the vertical asymptote of the graph of $y = 4 + \log_5(x + 2)$.

22. Determine the x -intercept of the graph of $y = \log_2(x - 7)$.

23. Use properties of logarithms to expand: $\ln(xyz)$

24. Use properties of logarithms to expand: $\log\left(\frac{u^4}{w^3}\right)$

25. Use properties of logarithms to expand: $\log_2\left(\frac{a^2b^3}{c^4d^5}\right)$

26. Write as a single logarithmic expression: $\ln x + \ln 5$

27. Write as a single logarithmic expression: $2 \log x + 5 \log y - 7 \log z$

28. Simplify: $\ln e^8 + \ln e^4$

29. Use the change-of-base formula to write $\log_5 6$ in terms of natural logarithms. Then use your calculator to compute the value. Round to the nearest hundredth.

30. Use the change-of-base formula to write $\log_7 63$ in terms of common (base-10) logarithms. Then use your calculator to compute the value. Round to the nearest hundredth.

31. Solve for x : $16 = 8^{x-3}$

32. Solve for x : $4 \log_2(x + 12) = 12$

33. Solve for x : $e^{x^2} = e^{3x+4}$

34. Solve for x : $e^{2x} - 7e^x + 12 = 0$

35. Solve for x . Round your answer to the nearest hundredth. $2^{3x} = 15$

36. Solve for x . Round your answer to the nearest hundredth. $4 \ln(x + 6) = -8$

37. Solve for x . Round your answer to the nearest hundredth. $\ln(x + 3) - \ln 2 = 3$

38. Solve for x . Round your answer to the nearest hundredth. $\log_5(x-7) = 1 + \log_5(x+1)$

39. In an effort to control vegetation overgrowth, 100 rabbits are released into an isolated area that is free of predators. After one year, the rabbit population has increased to 500. Assuming exponential population growth, what will the population be after another 6 months?

Plutonium-239 has a half-life of about 24,100 years. Use a model of the form $P(t) = Ae^{-kt}$ to determine the initial amount of Pu-239 if there were 0.4 grams remaining after 1000 years.

40. Polonium-210 has a half-life of 140 days. A scientist has 25 grams of Polonium-210. How many grams will remain after one year?

41. One-hundred animals were released into a preserve where their population grows according to the model $P(t) = \frac{1000}{1 + 9e^{-0.1656t}}$, where t is measured in months. After how long will the population reach 750 animals?