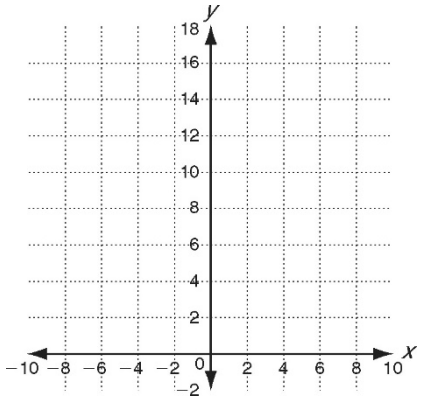
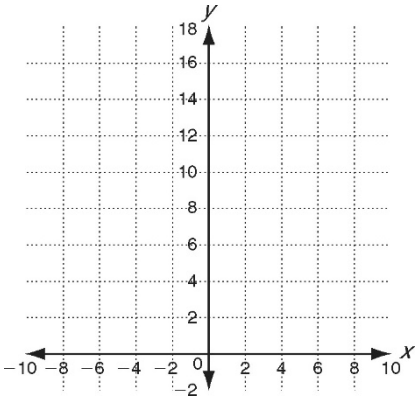
Algebra 2 Honors **Name**_____
WS: Chapter 4 Review **Date**_____**Block**_____

Graph each function. State the domain, range and asymptote.
Note: Your graph should include *at least* three clearly labeled points and the asymptote.

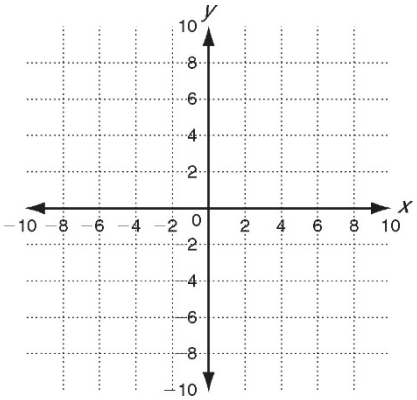
1. $g(x) = 5(2^{-x})$



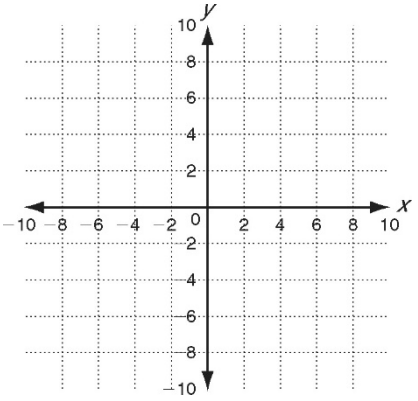
2. $g(x) = 5^{\frac{x}{4}}$



3. $g(x) = \log(x+5)$



4. $g(x) = 3 - \ln x$



5. Given the set of transformations on *f*, $f(x) = \log_4 x$, write the equation that yields *g*.

a. 3 units left, 2 units up $g(x) =$ _____

b. 4 units right, reflection in the *x*-axis $g(x) =$ _____

c. reflection in the *y*-axis, down 3 $g(x) =$ _____

6. Write the transformed function.
The function $f(x) = 8 \cdot 7^{2x} - 5$ is horizontally stretched by a factor of 2, vertically compressed by a factor of 0.5, translated 1 unit right, and reflected across the *x*-axis.

In 7 -14, evaluate each expression WITHOUT A CALCULATOR.

7. $\log_3 81^5$

8. $\log_{\frac{1}{4}} 8$

9. $\left(\log 10^{8x}\right)\left(\ln e^7\right)$

10. $5^{\log_5 30 - \log_5 2}$

11. $\ln e$

12. $2\log 5 + \log 4$

13. $e^{\ln 3xy^2}$

14. $\log_6 \frac{1}{216}$

15. Rewrite $\log_{16} \frac{1}{4} = -\frac{1}{2}$ in exponential form.

16. Rewrite $3^{-4} = \frac{1}{81}$ in logarithmic form.

17. Colleen's station wagon is depreciating at a rate of 9% per year. She paid $24,500 for it in 2002. What will the car be worth in 2008 to the nearest hundred dollars?

18. A parcel of land Jason bought in 2000 for $100,000 is appreciating in value at a rate of about 4% each year. Write a function to model the appreciation of the value of the land, and determine (algebraically) in what year will the land double its value?

19. A deposit of $10,000 is made in a savings account for which the interest is compounded continuously. The balance will double in 5 years.

a. What is the annual interest rate for this account?

b. Find the balance after 3 years.

20. Ariana has a choice of two investments. She can invest $12,000 at 5% for 8 years, or she can invest $9000 at 6.5% for 7 years. Both accounts are compounded continuously. Which investment will result in the greater amount of interest earned?

21. Use the natural decay function, $N(t) = N_0 e^{-kt}$, to find the decay constant for a substance that has a half-life of 1000 years.

22. Use the natural decay function, $N(t) = N_0 e^{-kt}$, to find the age of a fossil containing 35% of the original amount of a particular substance. This substance has a half-life of 2450 years.

23. Newton's Law of Cooling: $T = T_S + (T_0 - T_S)e^{-kt}$, where T_0 is the initial temperature and T_S is the surrounding temperature.

Your car just overheated on the drive home from work and is stuck on the side of the road. It overheated at 300°F and can be driven again at 230°F. If k = 0.0048 and it is 65°F outside, how long (in minutes) do you have to wait until you can continue driving?

Use the change of base formula to evaluate:

24. $\log_5 7$

25. $\log_{\frac{1}{3}} \frac{1}{5}$

Use $\log_a 2 \approx 0.3562$ and $\log_a 3 \approx 0.5646$ to rewrite and evaluate the following expressions.

26. $\log_a\left(\frac{2}{3}\right)$

27. $\log_a 6$

28. $\log_a \frac{9}{4}$

Expand each expression.

29. $\log_5 7x^3y$

30. $\ln\left(\frac{x^2y^3}{x-y}\right)$

31. $\ln\sqrt{x^3y^2}$

Condense each expression.

32. $\frac{1}{3}\log_4(x+y)$

33. $3\ln(x-2)-2\ln(x+2)$

34. $\log 8+3\log x-\log 7$

Solve each equation *algebraically*. Work MUST be shown.

35. $16^{3x}=8^{x+6}$

36. $-4\log_6(9x)-7=-23$

37. $12^{x-1}=20^2$

38. $\left(\frac{1}{16}\right)^{x+5}=8^2$

39. $216^{\frac{x}{3}}=36^{2x+3}$

40. $7\cdot 9^{2x-4}+3=45$

41. $e^{4x}-7=10$

42. $3+e^{-2x}=11$

43. $\log_5(4x-5)^2=6$

44. $\log x-\log 8=3$

45. $\ln(x^2-9)=\ln(5x+5)$

46. $\log x^3+\log 8=3$

47. $\log(x^2-1)-\log 12=1$

48. $\ln 5x-9=11$