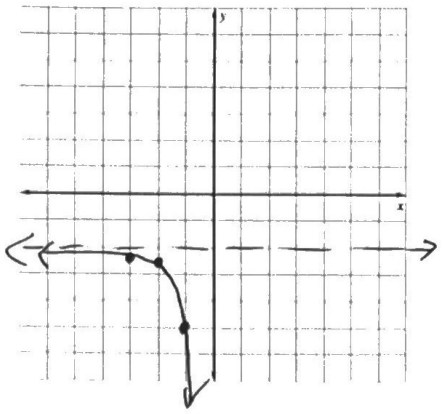
Algebra 2 ~ Chapter 7 Review Name Key

(1-6) Graph each function and draw the asymptote. State the domain and range. (TI-Nspire Allowed)

1. $f(x) = -3 \cdot 4^{x+1} - 2$

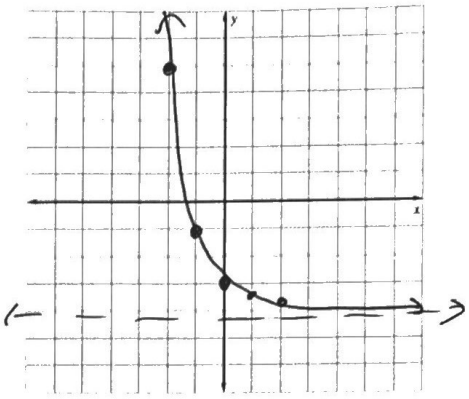
x	y
-3	-2.19
-2	-2.75
-1	-5
0	-14
1	-50



Domain: $\mathbb{R}$ Range: $y < -2$

2. $y = \left(\frac{1}{3}\right)^x - 4$

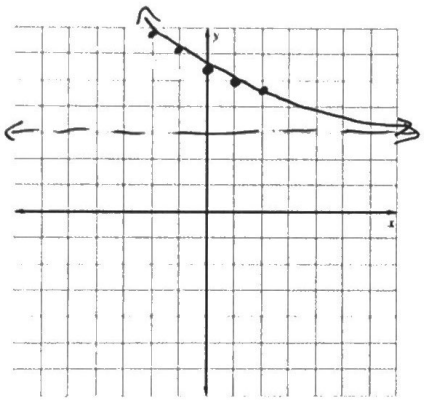
x	y
-2	5
-1	-1
0	-3
1	-3.67
2	-3.89



Domain: $\mathbb{R}$ Range: $y > -4$

3. $f(x) = 2(0.8)^{x-1} + 3$

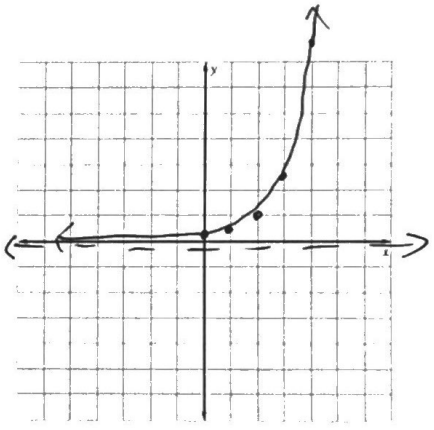
x	y
-2	6.91
-1	6.125
0	5.5
1	5
2	4.6



Domain: $\mathbb{R}$ Range: $y > 3$

4. $y = e^{x-2}$

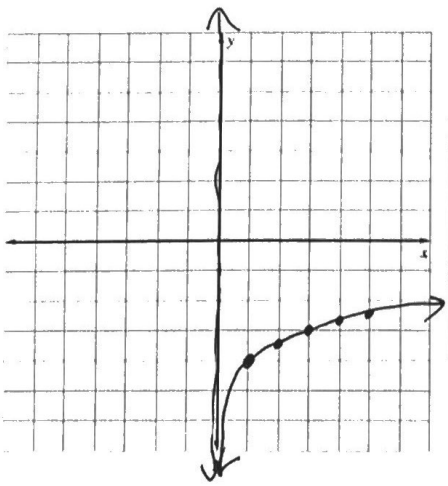
x	y
0	0.14
1	0.37
2	1
3	2.72
4	7.39



Domain: $\mathbb{R}$ Range: $y > 0$

5. $y = \log_3 x - 4$

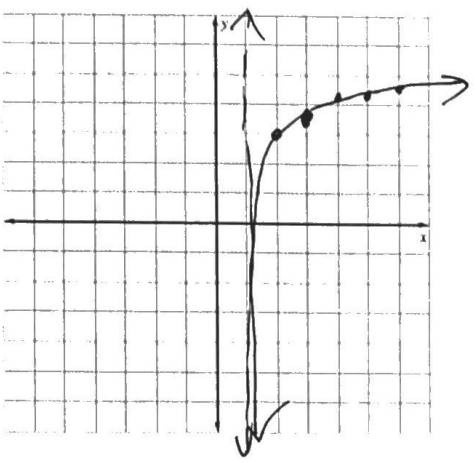
x	y
1	-4
2	-3.37
3	-3
4	-2.74
5	-2.54



Domain: $x > 0$ Range: $\mathbb{R}$

6. $f(x) = \ln(x-1) + 3$

x	y
2	3
3	3.69
4	4.10
5	4.38
6	4.61



Domain: $x > 1$ Range: $\mathbb{R}$

(7-18) Evaluate the logarithm without using a calculator.

7. $\log_3 243$

5

8. $\log_7 1$

0

9. $\log_{1/6} 216$

-3

10. $\log_{125} \frac{1}{5}$

$-\frac{1}{3}$

11. $\log_5 25$

2

12. $\log_2 \frac{1}{32}$

-5

13. $\log_6 1$

0

14. $\log 1000$

3

15. $\ln e$

1

16. $\log_{1/3} 27$

$\left(\frac{1}{3}\right)^{\square} = 27$

$\boxed{-3}$

17. $\log_8 8$

1

18. $\log_{1/4} 16$

-2

(19-21) Simplify the expression without using a calculator.

19. $e^{-2} \cdot e^{6}$

e^4

20. $(2e^{-2})^{-4}$

$\frac{e^8}{16}$

21. $\frac{e^{-5} \cdot e^{7}}{e^{-3}}$

e^5

(22-24) Find the inverse of the function.

22. $y = 7^x$

$y = \log_7 x$

23. $y = \log_6 x$

$y = 6^x$

24. $y = \ln(x + 2) - 1$

$\boxed{y = e^{(x+1)} - 2}$

(25-28) Expand the expression without using a calculator.

25. $\log_8 3xy$ $\log_8 3 + \log_8 x + \log_8 y$

26. $\ln 10x^3y$ $\ln 10 + 3\ln x + \ln y$

27. $\log\frac{8}{y^4}$ $\log 8 - 4\cdot\log y$

28. $\ln\frac{3y}{x^5}$ $\ln 3 + \ln y - 5\ln x$

(29-31) Condense the expression without using a calculator.

29. $3\log_7 4 + \log_7 6$ $\log_7 384$

30. $\ln 12 - 2\ln x$ $\ln\left(\frac{12}{x^2}\right)$

31. $2\ln 3 + 5\ln 2 - \ln 8$ $\ln(36)$

(32-35) Use $\log 4 \approx 0.602$ and $\log 12 \approx 1.079$ to evaluate the logarithm without using a calculator.

32. $\log 48$ 1.681

33. $\log 64$ 1.806

34. $\log\frac{1}{3}$ -.477

35. $\log\frac{1}{12}$ -1.079

(36-43) Solve the equation. Check for extraneous solutions. (TI-Nspire Allowed)

36. $7^{2x} = 30$ $x = 0.87$

37. $3\log(x-4) = 6$ $x = 104$

38. $\log_4 x + \log_4(x+6) = 2$ $x = \cancel{-8}, 2$

39. $7^{3x+4} = 49^{2x+1}$ $x = 2$

40. $4^{2x-5} = 64^{3x}$ $x = \frac{-5}{7}$

41. $\log_5(5x+9) = \log_5 6x$ $x = 9$

42. $2\log_3 x - \log_3 2 = \log_3(5x-12)$

$x = 6, 4$

43. $-4e^{2x} + 3 = -7$

$x = 0.46$

44. Write an exponential function $y = ab^x$ whose graph passes through the points (3, 8) and (5, 2).

$y = 64 \cdot \left(\frac{1}{2}\right)^x$

45. From 1996 to 2001, the number of households that purchased lawn and garden products at home gardening centers increased by about 4.85% per year. In 1996, about 62 million households purchased lawn and garden products. Write a function giving the number of households H (in millions) that purchased lawn and garden products t years after 1996. Determine how many households purchased lawn and garden products in 2000.

$74.9 million

46. You deposit $2500 in an account that pays 3.5% annual interest compounded continuously. What is the balance after 8 years?

$3307.82

47. You deposit $1500 in an account that pays 7% annual interest compounded daily. Find the balance after 2 years.

$1725.39