

Unit 3 Test Review

Name _____

Graph

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

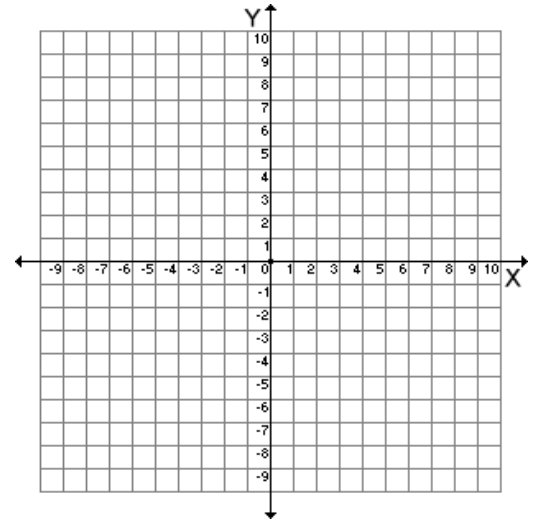
Domain: _____

Range: _____

Y-Intercept: _____

Asymptotes: _____

x	y
-1	
0	
1	



2. $f(x) = \frac{1}{2}(3)^x - 3$

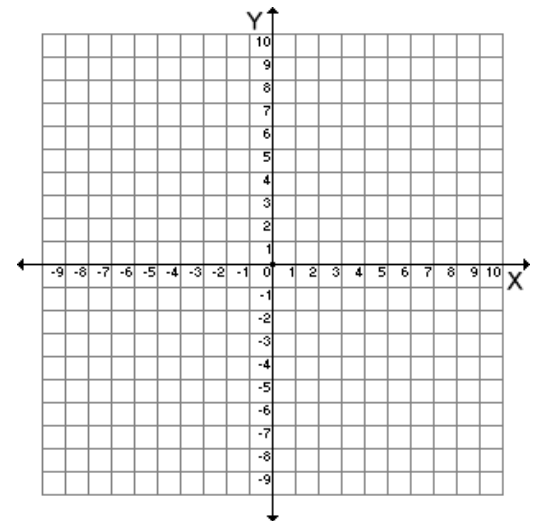
Domain: _____

Range: _____

Y-Intercept: _____

Asymptotes: _____

x	y
-1	
0	
1	



3. $f(x) = -\log(x) + 2$

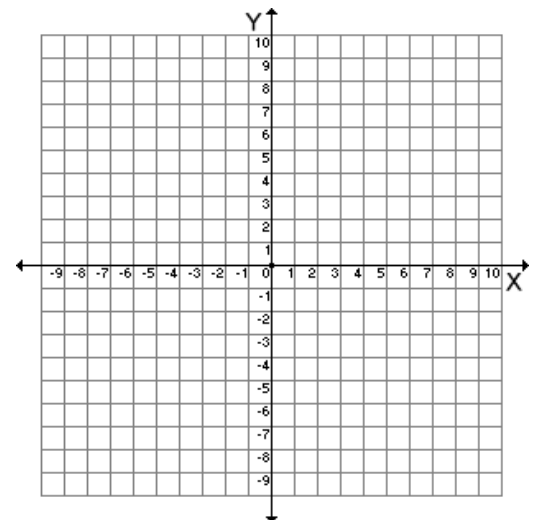
Domain: _____

Range: _____

Y-Intercept: _____

Asymptotes: _____

x	y
	-1
	0
	1



Solve for x using same base.

4. $9^{4x} = 8$	5. $25^{x-2} = 5^{4x+12}$	6. $27(3)^x = 243$
7. $3^{x+4} = \frac{1}{81}$	8. $5^{r+2} \cdot 5^{2r} = 25$	9. $16^{2-x} = \left(\frac{1}{64}\right)^{3-x}$

Write in exponential form.

10. $\log_2\left(\frac{1}{8}\right) = -3$	11. $\log 100 = 2$	12. $\ln 20.086 = 3$
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Write in logarithmic form.

13. $10^3 = 1000$	14. $e^0 = 1$	15. $4^3 = 64$
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Use the properties of logarithms to expand the expression.

16. $\log_3 xy$	17. $\log_4 rst$
18. $\log_b \frac{\sqrt{x}}{p}$	19. $\log_3 5\sqrt[3]{a}$

Condense the expression to the logarithm of a single quantity.

20. $2\log_3 x + \frac{1}{3}\log_3 y$	21. $2\log x - 7\log y$
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Evaluate. (Give simplified numerical answer).

22. $\log 1000$	23. $\log_9 27$	24. $\ln e^7$
25. $\log_2 \frac{1}{16}$	26. $e^{\ln 8 - \ln 4}$	27. $\log_3 (\log_4 64)$

Solve. (You may use a calculator to check your answers, but make sure that you work them by hand.)

28. $\log x + \log(x - 3) = 1$	29. $\log_3(x - 2) + \log_3 10 = \log_3(x^2 + 3x - 10)$	30. $\log_2(4 - 5x) = 2$	31. . $\log_5(5s) = \log_5(3 - 2s)$
32. $2\log_2 3 - \log_2(x + 1) = 3$	33. $\log_3(x^2 - 9) - \log_3(x + 3) = 1$	34. $\log_5(8 - 3n) = 0$	35. $\log_6(y + 4) + \log_6(3y) = 2$
36. $5^n = 75$	37. $3^{2x+1} = 15$	38. $2^x = 81$	39. $e^{2x} = 5$
40. $e^{2x} - 4e^x - 12 = 0$	41. $14e^{3x+2} = 560$	42. $5(10^{x-6}) = 7$	43. $8(10^{3x}) = 12$

You may use a calculator...

44. The population of Newmanville is growing at a rate of 4.3% per year. There are now 20,000 people in town.

a. Write a general equation to express the growth rate.

b. How many people will there be in town in 12 years?

c. When will there be 100,000 people?

45. Jordan knows that her 24 grams of Iodine-131 has a half-life of 8 days.

a. How much will be left after 22 days?

b. When will there be 6 grams?

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46. What is the growth rate of 19 bacteria if after 3.5 hours there are 2000 bacteria?
(continuous growth)

47. Suppose that \$5000 is invested at 4% compounded quarterly. After t years, you have \$7000. How many years was the money invested?

48. You invest \$2500 in an account at an interest rate r , compounded continuously.

a) Find the time needed for the investment to double if invested at a rate of 8.5%.

b) Find the time needed for the investment to triple if invested at a rate of 8.5%.