Part 1: No Calculator

Graph the function.

1. $y = 2(3)^{x+1} - 5$
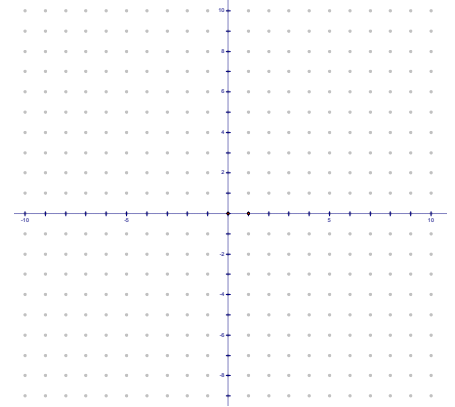
X	Y
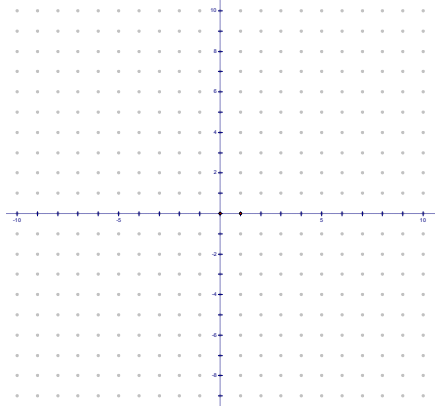
Domain:_____

Range:_____

Asymptote:_____

2. $y = \log_6 x$

X	Y

Domain:_____

Range:_____

Asymptote:_____

3. Use $y = (.92)^x$ to answer the following:

a.   What is the starting amount?   _____

b.   Is this a Exp Growth or Exp Decay? Why?_____

c.   What is the rate/percent?_____

d.   Rewrite as a log function:_____

4. Rewrite the expression in exponential form.

a. $\log_{16} 4 = \dfrac{1}{2}$

b. $\ln x = 3$

5. Expand the expressions

a. $\log \dfrac{2x^3}{5}$

b. $\ln \dfrac{3\sqrt{x}}{y^5 z}$

6. Condense the expressions

a. $\log_3 4 + \log_3 2 + \log_3 2$

b. $\log 3 + \dfrac{1}{2}\log x - \log 5$

7. Evaluate or solve for x.

a. $\log_5 125$

b. $\log_{36} 6$

c. $\log_4 1$

d. $\log_3 \dfrac{1}{27}$

e. $\ln e^{12}$

f. $\log_5 x = -2$

g. $\log_{\frac{1}{3}} x = 3$

8. Explain the difference between a common logarithm and a natural logarithm.

Part 2: Calculator

9. From 1990 to 2000, the population of California can be modeled by $P = 27,216,000(1.0228)^t$ where t is the number of years since 1990.

a. Estimate the population in 2004. _____

b. When will California reach 40,000,000? _____

c. Will this trend continue forever? Explain._____

10. You buy a new car for $22,500. The value of the car decreases by 25% each year.

a. Write an exponential model giving the car's value V (in dollars) after t years. _____

b. What is the value of the car after 3 years? _____

c. In how many years is the car worth $5300 (must show algebraic work and be accurate to 2 decimal places)?

11. You deposit $2200 in an account that pays 3% annual interest. Find the balance after 15 years if the interest is compounded with the given frequency. Show your set-up!!!!!!!!!!!!

a. quarterly   b. continuously

12. Your goal is to have $11,000 to buy a used car in 2 years. How much would you need to deposit today if your account pays 4.5% annual interest, compounded monthly?

13. What is e approximately equal to (accurate to three decimal places)? Is e rational or irrational? Explain.

_____

14. Why is $\log_2(-6)$ not possible?   Why can't you take a logarithm of a negative number? Use complete sentences.

15. Evaluate the logarithm. Round answer to 3 decimal places

a. $\log_5 1.25$

b. $\log_{\frac{1}{3}} 0.0005$

c. $\ln 24$

16. Solve the exponential equation. Check for extraneous solutions. Round the result to 3 decimal places if necessary.

a. $3e^{3x} = 12$

b. $10^{-x+4} + 7 = 5$

c. $9^{2x} = 3^{2x+4}$

d. $5^{0.5x} + 12 = 21$

17. Solve the logarithmic equation. Check for extraneous solutions. Round the result to 3 decimal places if necessary.

a. $\log_2(3x-1)=8$

b. $\ln(3x-3)=\ln(x+15)$

c. $4+\log_9(3x-7)=6$

d. $\log_4 x+\log_4(5x-2)=2$

18. The pH of a patient's blood can be calculated using the Henderson-Hasselbach Formula, $pH=6.1+\log\dfrac{B}{C}$, where B is the concentration of bicarbonate and C is the concentration of carbonic acid. The normal pH of blood is approximately 7.4.

a. Expand the right side of the formula.

b. Find the pH of blood that has bicarbonate concentration of 38 and carbonic acid concentration of 2