

Exponential and Logs Test Study Guide

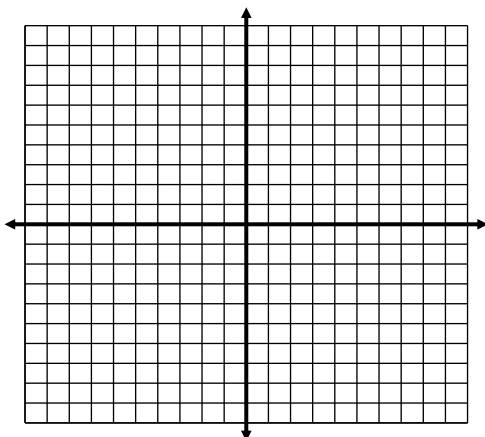
Directions: State whether the following is exponential growth or decay.

1) $f(x) = \left(\frac{7}{8}\right)^x$

2) $f(x) = 4^{-x}$

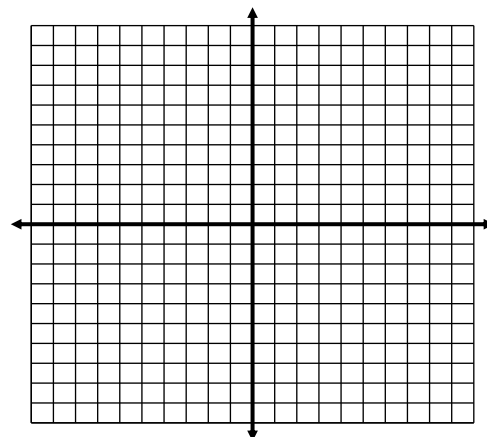
Graph the following functions.

3) $y = 2^{x+3} - 1$



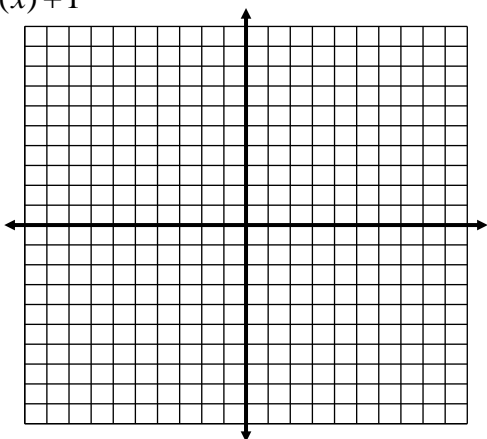
Growth or Decay? _____
 Transformations: _____
 Domain: _____ Range: _____
 Asymptote: _____
 Increasing or Decreasing? _____
 X-intercept: _____ Y-intercept: _____
 As $x \rightarrow$ _____, $f(x) \rightarrow$ _____
 End Behavior: _____
 As $x \rightarrow$ _____, $f(x) \rightarrow$ _____

4) $y = e^{x+1} - 3$



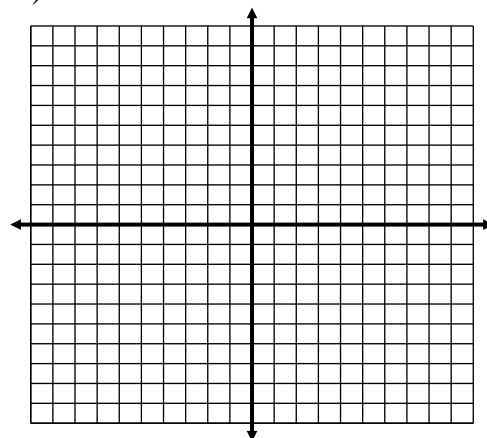
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5) $y = \log_3(x) + 1$



Transformations: _____
 Domain: _____ Range: _____
 Asymptote: _____
 Increasing or Decreasing? _____
 X-intercept: _____ Y-intercept: _____
 As $x \rightarrow$ _____, $f(x) \rightarrow$ _____
 End Behavior: _____
 As $x \rightarrow$ _____, $f(x) \rightarrow$ _____

6) $y = -\ln(x-2) + 3$



Transformations: _____
 Domain: _____ Range: _____
 Asymptote: _____
 Increasing or Decreasing? _____
 X-Intercept: _____ Y-intercept: _____
 As $x \rightarrow$ _____, $f(x) \rightarrow$ _____
 End Behavior: _____
 As $x \rightarrow$ _____, $f(x) \rightarrow$ _____

Describe following transformations from the parent function.

7) $y = 4(2)^{x+5} - 7$

8) $y = 5(.67)^{x-7} + 9$

Solve.

9) The population of a hamster farm was 120 hamsters in 2003. The population grows 3.3% per year. What is the population of the hamster farm in 15 years? Round answer to the nearest hamster.

10) In 2007, you deposit \$1,230 in a bank account that compounds interest continuously at 5.3%. How long will it take you to save \$7,000?

Rewrite the equation in exponential form.

11) $\log_9 59049 = x$

12) $\log_6 \frac{1}{36} = -2$

13) $\log_{512} \frac{1}{8} = -\frac{1}{3}$

14) $\ln 12.2 = 2.5$

Rewrite the equation in logarithmic form.

15) $5^4 = 625$

16) $6^x = 1296$

17) $v^{9x+7} = 43$

18) $e^3 = 20.1$

Evaluate without using a calculator.

19) $\log_3 27$

20) $\ln e^{12}$

21) $\ln \sqrt[4]{e}$

22) $\ln \frac{1}{e^5}$

23) $4^{\log_4 15}$

24) $\log_5 \frac{1}{125}$

25) $e^{\ln 2x}$

26) $3^{\log_3 2x}$

Write each expression as a single logarithm. Then simplify, if possible.

27) $\ln 44 - \ln 12$

28) $\log_3 x - (5 \log_3 y + 7 \log_3 z)$

Expand each logarithmic expression.

$$29) \log \frac{x^2}{4y^7}$$

$$30) \ln \frac{12x^4y^2}{5z^6}$$

Solve the exponential equations

$$31) 3^{-2m} = 3^{3m+2}$$

$$32) 3^{3x-2} = 81$$

$$33) 216^a = 36^{2a-2}$$

$$34) 2^{-p+1} = 1$$

$$35) 3(2^{x+4}) = 350$$

$$36) 2e^x + 5 = 115$$

Solve the logarithmic equations

$$37) \log 5x = \log(2x + 9)$$

$$38) \ln x + \ln(x - 2) = \ln 3$$