Unit 7 Test Study Guide
(Exponential & Logarithmic Functions)

Name: _____

Date: _____ Block: _____

Topic 1: Graphing Exponential & Logarithmic Functions

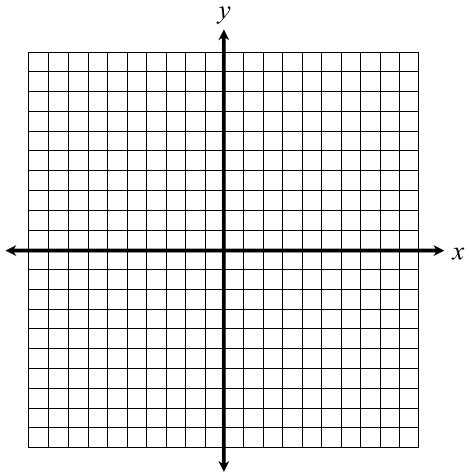
Describe as an exponential growth or decay.

1. $f(x) = 5\left(\frac{2}{3}\right)^x$

2. $f(x) = \frac{1}{3}\left(\frac{6}{5}\right)^x$

Graph each function and identify its key characteristics.

3. $f(x) = 3^{x+1} - 6$



Domain: _____

Range: _____

End Behavior:

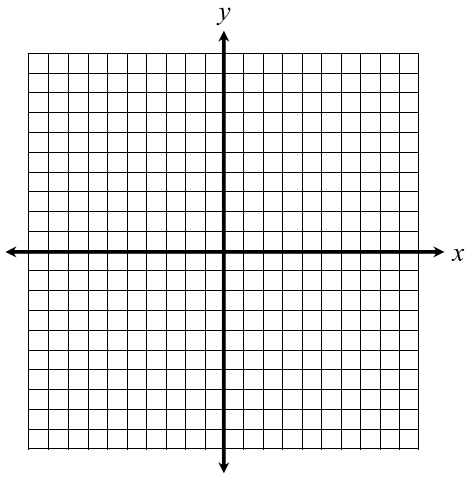
As $x \to \infty$, $f(x) \to$ _____

As $x \to -\infty$, $f(x) \to$ _____

***y*-intercept:** _____

Asymptote: _____

4. $f(x) = \left(\frac{1}{2}\right)^{x-5} + 2$



Domain: _____

Range: _____

End Behavior:

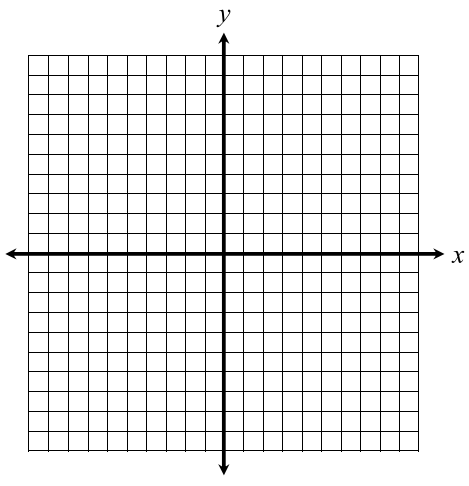
As $x \to \infty$, $f(x) \to$ _____

As $x \to -\infty$, $f(x) \to$ _____

***y*-intercept:** _____

Asymptote: _____

5. $f(x) = \log_2 x - 3$



Domain: _____

Range: _____

End Behavior:

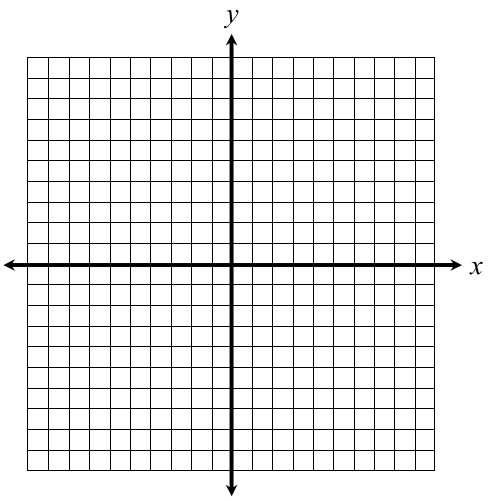
As $x \to$ _____, $f(x) \to \infty$

As $x \to$ _____, $f(x) \to -\infty$

***x*-intercept:** _____

Asymptote: _____

6. $f(x) = \log_{\frac{1}{3}}(x+2)+1$



Domain: _____

Range: _____

End Behavior:

As $x \to$ _____, $f(x) \to \infty$

As $x \to$ _____, $f(x) \to -\infty$

***x*-intercept:** _____

Asymptote: _____

Topic 2: Exponential vs. Logarithmic Form

Write in logarithmic form.			
7. $8^2 = 64$	**8.** $2^{x-4} = 32$	**9.** $10^{2x} = 54$	**10.** $e^6 = x - 2$
Write in exponential form.			
11. $\log_3 27 = 3$	**12.** $\log_x 7 = \frac{1}{2}$	**13.** $\log_4 90 = x$	**14.** $\ln x = 38$

Topic 3: Evaluating Logarithms

Evaluate each logarithm. Use the Change of Base Formula when necessary: $\log_b a =$			
15. $\log_9 81$	**16.** $\log_{81} 3$	**17.** $\log_5 \frac{1}{25}$	**18.** $\log_6 1$
19. $\log 63$	**20.** $\log_7 95$	**21.** $\log_2 78$	**22.** $\ln 42$

Topic 7: Applications

Exponential Growth	Exponential Decay	Compound Interest
a = initial amount r = growth rate t = time	a = initial amount r = decay rate t = time (in years)	P = initial amount r = rate n = # of times compounded/year t = time (in years)

41. Sophie invested $5,000 into an account that will increase in value by 2.3% each year. Write a function to model this situation, then find the value of the investment after 15 years.

42. A baseball card that was valued at $200 in 1980 has increased in value by 7% each year. Write a function to model this situation, then find the value of the card in 2016.

43. Miles invested $2,400 into a retirement account that earns 1.8% interest compounded bimonthly. Write a function to model this situation, then find the balance of the account after 25 years.

44. Sarah took out a $30,000 loan at a 4% interest rate to put a new pool in her backyard. If the interest is compounded quarterly, write a function to model this situation. How much will interest will she have paid after 12 years?