Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples
TRANFORMATIONS of Exponential Functions $f(x) = a \cdot b^{x-h} + k$	• h is the _____ shift. (**+** shifts _____, **–** shifts _____) • k is the _____ shift. (**+** shifts _____, **–** shifts _____) • If a is negative, the function is _____ across the ____- _____ • $\lvert a \rvert > 1$ represents a vertical _____. • $0 < \lvert a \rvert < 1$ represents a vertical _____.

Directions: (a) Identify the parent function, and **(b)** describe the transformations.

1. $f(x) = 3^x + 5$

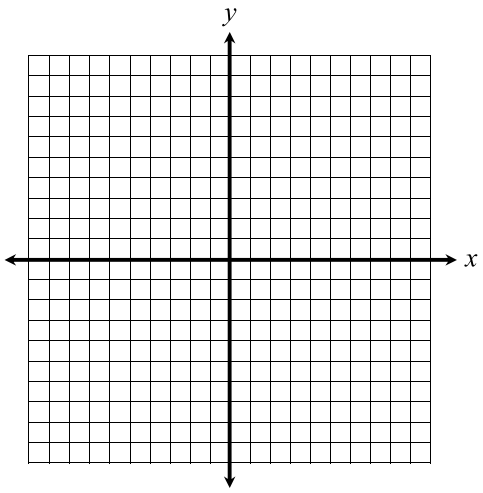
2. $f(x) = 2 \cdot \left(\frac{1}{4}\right)^{x-1}$

3. $f(x) = -\left(\frac{4}{3}\right)^{x+2} + 7$

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

Directions: Graph each function and identify its key characteristics.

5. $f(x) = 2^{x+5}$



Domain: _____

Range: _____

End Behavior:

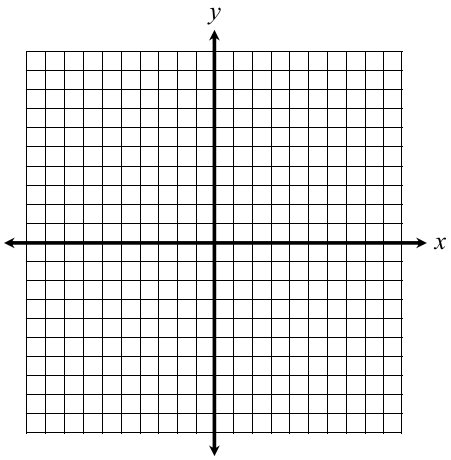
As $x \to \infty$, $f(x) \to$ _____

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

***y*-intercept:** _____

Asymptote: _____

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



Domain: _____

Range: _____

End Behavior:

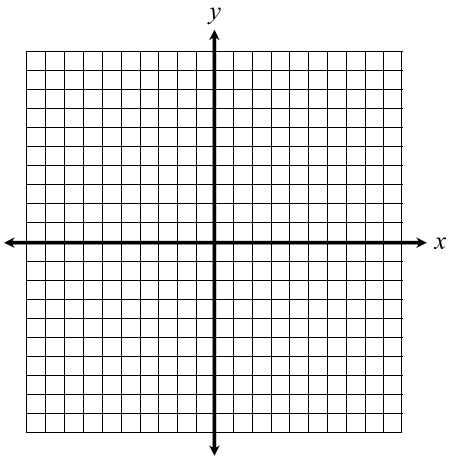
As $x\to\infty$, $f(x)\to$ _____

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

***y*-intercept:** _____

Asymptote: _____

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



Domain: _____

Range: _____

End Behavior:

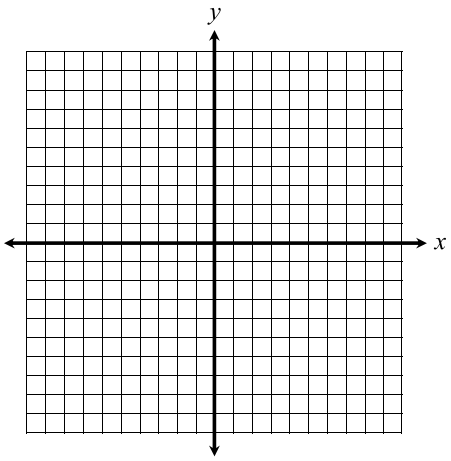
As $x\to\infty$, $f(x)\to$ _____

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

***y*-intercept:** _____

Asymptote: _____

8. $f(x)=\left(\frac{3}{2}\right)^{x-4}-5$



Domain: _____

Range: _____

End Behavior:

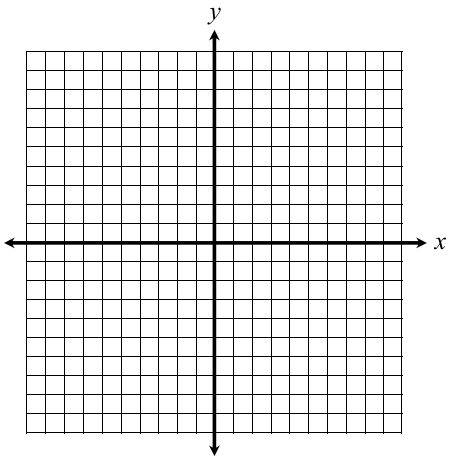
As $x\to\infty$, $f(x)\to$ _____

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

***y*-intercept:** _____

Asymptote: _____

9. $f(x)=-2\cdot 4^{x-2}$



Domain: _____

Range: _____

End Behavior:

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

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

***y*-intercept:** _____

Asymptote: _____

Name: _____ **Unit 7:** Exponential & Logarithmic Functions

Date: _____ **Bell:** _____ **Homework 1:** Graphing Exponential Functions

**** This is a 2-page document! ****

Directions: Classify each function as an exponential growth or an exponential decay. Sketch the curve.

1. $f(x)=\frac{1}{2}\cdot 5^{x}$

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

3. $f(x)=4\cdot\left(\frac{3}{8}\right)^{x}$

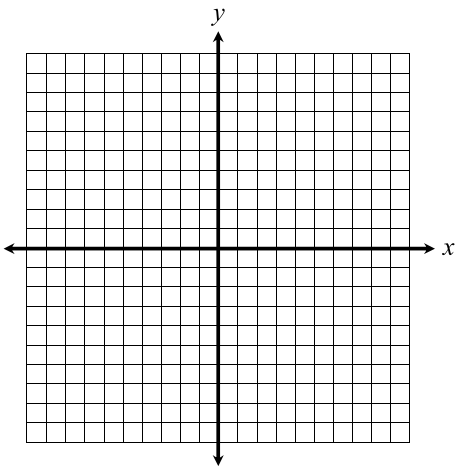
Directions: (a) Identify the parent function and **(b)** describe the transformations.

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

5. $f(x)=-3\cdot 2^{x-1}+7$

Directions: Graph each function and identify its key characteristics.

6. $f(x)=3^{x-2}-7$



Domain: _____

Range: _____

End Behavior:

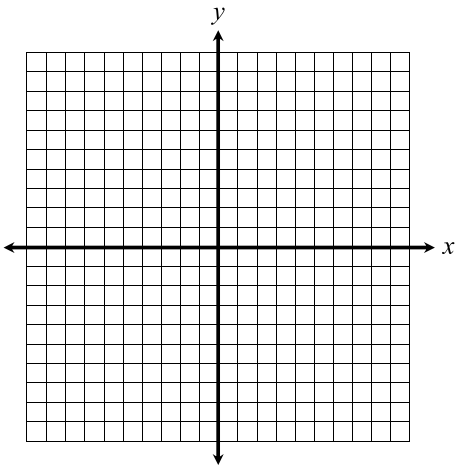
As $x\to\infty$, $f(x)\to$ _____

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

***y*-intercept:** _____

Asymptote: _____

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



Domain: _____

Range: _____

End Behavior:

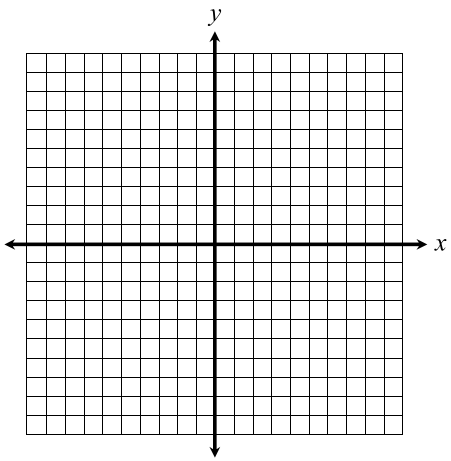
As $x\to\infty$, $f(x)\to$ _____

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

***y*-intercept:** _____

Asymptote: _____

8. $f(x) = \frac{1}{2} \cdot 2^x - 6$



Domain: _____

Range: _____

End Behavior:

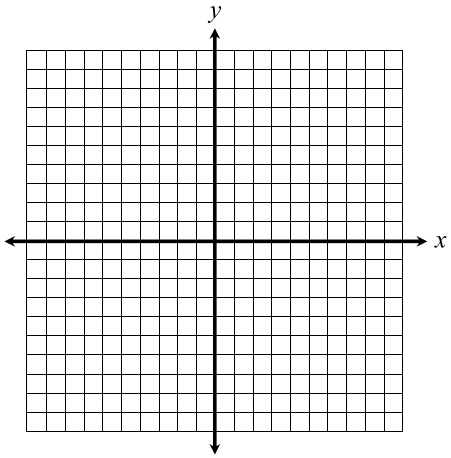
As $x \to \infty$, $f(x) \to$ _____

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

y-intercept: _____

Asymptote: _____

9. $f(x) = \frac{1}{8} \cdot 4^{x+1}$



Domain: _____

Range: _____

End Behavior:

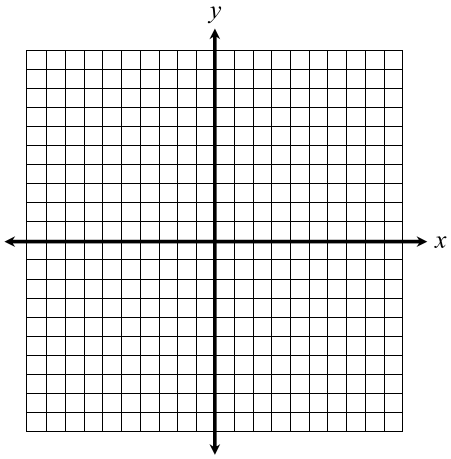
As $x \to \infty$, $f(x) \to$ _____

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

y-intercept: _____

Asymptote: _____

10. $f(x) = 4 \cdot \left(\frac{2}{3}\right)^x + 1$



Domain: _____

Range: _____

End Behavior:

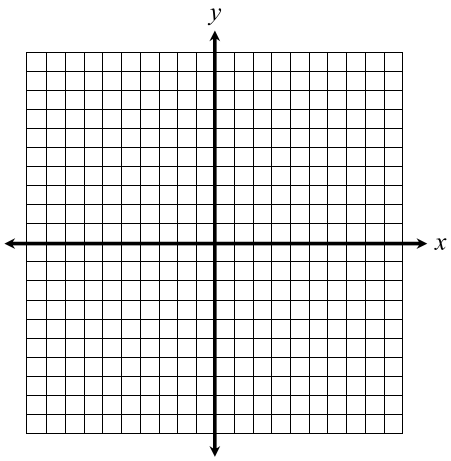
As $x \to \infty$, $f(x) \to$ _____

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

y-intercept: _____

Asymptote: _____

11. $f(x) = -\frac{1}{3} \cdot 6^x + 5$



Domain: _____

Range: _____

End Behavior:

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

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

y-intercept: _____

Asymptote: _____

Name:	Date:
Topic:	Class:

Main Ideas/Questions	Notes/Examples	
Exponential Growth	Occurs when a **quantity exponentially increases** over time.	
	Formula:	a = _____ r = _____ t = _____
Examples	**1.** The original value of an investment is \$1,800. If the value has increased by 7% each year, write an exponential function to model the situation. Then, find the value of the investment after 15 years.	
	2. In 2002, there were 972 students enrolled at Oakview High School. Since then, the number of students has increased by 1.5% each year. Write an exponential function to model the situation, then find the number of students enrolled in 2014.	
Exponential Decay	Occurs when a **quantity exponentially decreases** over time.	
	Formula:	a = _____ r = _____ t = _____
Examples	**3.** An investment of \$12,000 is losing value at a rate of 4% each year. Write an exponential function to model the situation, then find the value of the investment after 9 years.	
	4. Mark bought a brand new car for \$35,000 in 2008. If the car depreciates in value approximately 8% each year, write an exponential function to model the situation. Then, find the value of the car in 2015.	

Compound Interest

Occurs when interest is calculated on both the **principal amount AND the accrued interest** thus far.

Formula:

P = _____

r = _____

n = _____

t = _____

Examples

5. Laura deposited $12,000 into an account that earns 8% interest. How much money will she have in 5 years if the interest is compounded quarterly?

6. Jack took out a 6-year loan for $25,000 to purchase a boat at a 4.5% interest rate. If the interest is compounded monthly, what wil he have paid total over the course of the loan?

7. An investment account pays 3.9% interest compounded semi-annually. If $4,000 is invested in this account, what will be the balance after 12 years?

8. A savings account offers 0.8% interest compounded bimonthly. If Bob deposited $300 into this account, how much interest will he earn after 10 years?

9. Suppose you invest $750 into an account that pays 3% interest compounded weekly. How much interest will you have earned after 20 years?

Name: _____ **Unit 7:** Exponential & Logarithmic Functions

Date: _____ **Bell:** _____ **Homework 10:** Applications of Exponential Functions

**** This is a 2-page document! ****

Exponential Growth & Decay

1. Vanessa invested $2,500 into an account that will increase in value by 3.5% each year. Write an exponential function to model this situation, then find the value of the investment after 20 years.

2. The average price of a movie ticket in 1990 was $4.22. Since then, the price has increased by approximately 3.1% each year. Write an exponential function to model this situation, then find the price of a ticket in 2016.

3. A virus has infected 400 people in the town and is spreading to 25% more people each day. Write an exponential function to model this situation, then find the number of people that will be infected in 10 days.

4. The population of a small town was 10,800 in 2002. Since then, the population has decreased at a rate of 2.5% each year. Write an exponential function to model the situation, then find the population of the town in 2020.

5. Manny bought a brand new car in 2012 for $28,750. If the car depreciates by 12% each year, write an exponential function to model the situation, then find the value of the car in 2018.

Compound Interest

6. Anisha invested $8,000 in an account that earns 10% interest. How much money will she have in 15 years if the interest is compounded quarterly?

7. Kevin borrowed $32,500 to purchase a new car. If the rate on the loan is 6% compounded annually, how much will he pay in total over the course of the 5 year loan?

8. Scott invested $1,600 into a retirement account that earns 2.4% interest compounded monthly. What will be the balance of the account after 30 years?

9. Kaylee used her graduation money to set up a savings account that earns 3.4% interest compounded weekly. If the original amount deposited was $500, how much interest will she have earned after 10 years?

10. Mr. and Mrs. Rainer took out a $240,000 loan to purchase their home. If the interest rate on the loan is 1.2% compounded bimonthly, how much interest will they have paid after 30 years?