Algebra 2
Chapter 7B Review
Graphing Exponential and Logarithmic Functions

Name: KEY
Date: _____ Period: _____

1. Given the parent function $f(x) = \log x$, write the equation of the new function after it was translated 3 units down and 5 units to the right.

$f(x) = \log(x-5) - 3$

2. Given the parent function $f(x) = (2)^x$ write the equation of the new function after it was reflected over the x – axis, translated 2 units up, and 1 unit to the left.

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

3. Given the parent function $f(x) = \left(\frac{2}{5}\right)^x$ write the equation of the new function after it had a vertical stretch of 5, horizontal shift right 7 units and vertical shift down 2 units.

$f(x) = 5\left(\frac{2}{5}\right)^{x-7} - 2$

Use the following scenario to answer the questions 4 - 6.

In 1990, the population of Florida's lizards can be modeled by the equation $P = 277(1.0346)^t$, where t represents the number of years since 1990.

4. What was the population of lizards in 1999 (round to the nearest lizard)?

$P = 277(1.0346)^9$

$P = 376.$

5. Using the modeled equation from above, predict the population of lizards in the year 1990.

$P = 277(1.0346)^0$

$P = 277$

6. After how many years would there be a population of at least 350 lizards? SHOW YOUR WORK!!

$350 = 277(1.0346)^t$

$\frac{350}{277} = (1.0346)^t$

$\log_{1.0346}\left(\frac{350}{277}\right) = t = 6.88$

$A = P(1+r)^t$ $A = P\left(1+\frac{r}{n}\right)^{nt}$ $A = Pe^{rt}$ $A = P(1-r)^t$

7. Three years from now you want to purchase a home theater system that costs $1,300. How much should you invest into an account that pays 3.75% interest and is compounded monthly so that you are able to purchase it in 3 years?

$1300 = P\left(1 + \frac{.0375}{12}\right)^{12 \cdot 3}$

$P = \$1161.88$

8. Mrs. Collins has caught the flu and has decided to take some medicine to help her feel better. She took a pill which contained a dose of 500 milligrams of flu medicine. The medicine decreases in her body at a rate of 32% per hour. How many milligrams of the medicine will be left in her system after 6 hours?

$A = 500(1-.32)^6$

$A = 49.4$

9. You receive a $400 gift which you want to invest for 5 years. How much money would you have in the bank account if the interest rate is 3.5% and is compounded continuously?

$A = 400e^{.035 \cdot 5}$

$A = \$476.50$

10. Most cars decrease in value after you leave the dealer. However, some cars are now considered "classics" and actually increase in value. You have the choice of owning two cars:

A 2004 Mazda Maita which is worth $18,000 but is depreciating 10% per year, or a classic 1970 Ford Mustang which is worth $12,500 and is increasing in value by 6.5% each year.

a.) Write an equation to represent the value of each car over time.

$A = 18000(1-.10)^t$

Ford $A = 12500(1+.065)^t$

b.) Using your equations from part (a), find the value of the Mazda and the Ford after 20 years.

$A = 18000(1-.10)^{20}$

$A = 2188.38$

$A = 12500(1+.065)^{20}$

$A = 44045.56$

c.) Which car would be the better investment? Explain your answer.

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

x	y
0	3
1	1.5

Growth or Decay? DECAY

Parent function: $y = (1/2)^x$

Vertical Stretch or Compression?

STRETCH OF 3

Asymptote: $y = -4$

Domain: $(-\infty, \infty)$

Range: $(-4, \infty)$

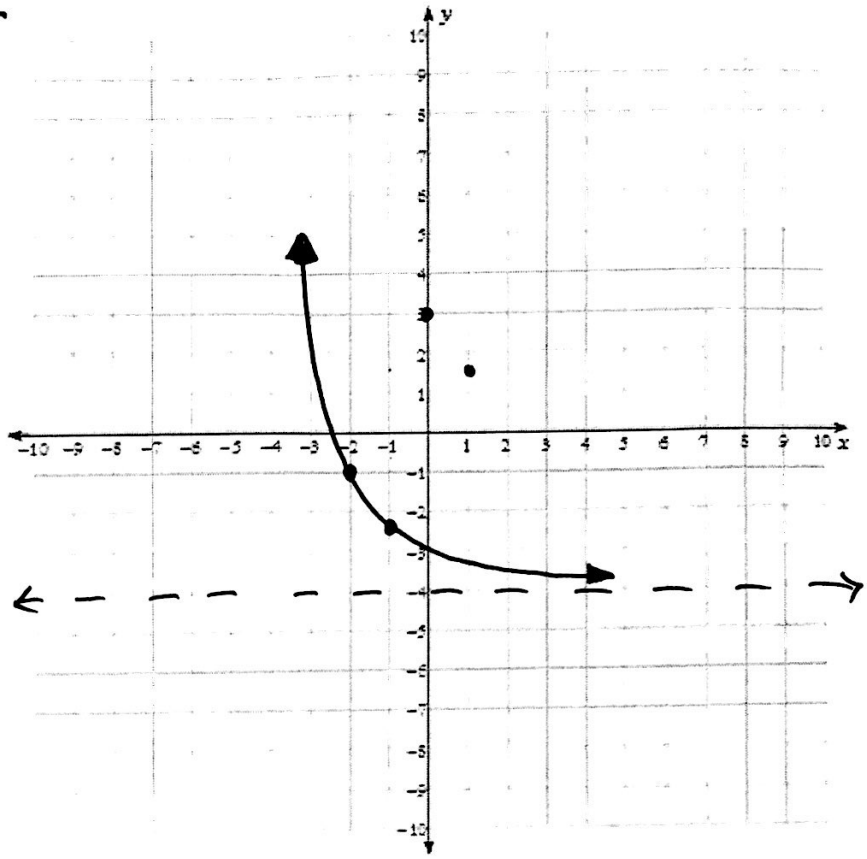
Solution(s): $x = -2.5$ (ESTIMATED)

End Behavior: As $x \to \infty, f(x) \to$ -4

As $x \to -\infty, f(x) \to$ ∞

Y-intercept: $(0, -3.25)$

Transformations: ← 2 ↓ 4



12. $y = (2)(3)^{x-4} + 3$

Growth or Decay? GROWTH

x	y
0	2
1	6

Parent function: $y = (3)^x$

Vertical Stretch or Compression?

STRETCH OF 2

Asymptote: $y = 3$

Domain: $(-\infty, \infty)$

Range: $(3, \infty)$

Solution(s): N/A

End Behavior: As $x \to \infty, f(x) \to$ ∞

As $x \to -\infty, f(x) \to$ 3

Y-intercept: $(0, 3.02)$

Transformations:

→ 4 ↑ 3