Name: Key Date: ______ Block: ______ #____

Review – Section 7.1-7.2
Algebra 2

Show all work for credit!! Box your answers!!

Identify each function or situation as an example of exponential growth or decay. What is the function's percent increase or decrease? What is the y-intercept?

Function	Exponential Growth (G) Exponential Decay (D)	Percent increase/decrease	y-intercept
1. $y=1298(1.63)^x$	G	63%	(0, 1298)
2. $y=0.8\left(\frac{1}{8}\right)^x$	D	87.5%	(0, .8)
3. $y=\frac{2}{3}(6)^x$	G	500%	(0, 2/3)
4. $y=16(0.27)^x$	D	73%	(0, 16)

Write an equation to represent each situation. Find the value of the function after 5 years. $y=ab^x$

5. A population of 250 frogs increases at an annual rate of 22%.

$y=250(1.22)^x$

$y=250(1.22)^5$

$y=675.68$ or 675 frogs

6. A stock priced at \$35 increases at a rate of 7.5% per year.

$y=35(1.075)^x$

$y=35(1.075)^5$

$y=\$50.25$

7. A \$47,500 delivery van depreciates 11% each year.

$y=47,500(.89)^x$

$y=47,500(.89)^5$

$y=\$26,524.28$

8. A population of 115 cougars decreases 1.25% each year.

$y=115(.9875)^x$

$y=115(.9875)^5$

$y=107.99$ or 107 cougars

9. Suppose the population of a certain endangered species decreases at a rate of 3.5% per year. You have counted 80 of these animals in the habitat you are studying.

a) Predict the number of animals that will remain after 10 years.

$y = 80(1-.035)^{10}$ 56.02 or 56 animals

$y = 80(.965)^{10}$

b) At this rate, after how many years will the population first drop below 15 animals?

$15 = 80(.965)^t$ 46 years

10. On their federal income tax returns, many self-employed individuals can depreciate the value of the business equipment they purchase. Suppose a computer valued at $6500 depreciates at a rate of 14.3% per year. After how many years is the value of the computer less than $2000?

$2000 = 6500(1-.143)^t$

$2000 = 6500(.857)^t$ 8 years

11. Calcium-47 is used for scanning bones for suspected disorders. It has a half-life of 113 hours. Write the exponential decay function for a 105-mg sample. Use the function to find the amount of calcium-47 left after 350 hours.

$y = 105(.5)^{3.10}$ 12.25 mg.

$t = \frac{350}{113} \approx 3.10$

12. Your 3 year investment of $20,000 received 5.2% interest compounded semi annually. What is your total return?

A = ?
P = 20,000
r = .052
n = 2
t = 3

$A = P(1+\frac{r}{n})^{nt}$

$A = 20000(1+\frac{.052}{2})^{2(3)}$

A = $23,329.97

13. You borrow $59,000 for 2 years at 11% which was compounded annually. What total will you pay back?

A = ?
P = 59000
r = .11
n = 1
t = 2

$A = 59000(1+.11)^2$

$A = 59000(1.11)^2$

A = $72,693.90

14. You invest $40,000 compounded quarterly at 14% interest. How much is your investment worth in 6.25 years?

$A = ?$
$P = 40000$
$r = .14$
$n = 4$
$t = 6.25$

$A = 40{,}000\left(1 + \frac{.14}{4}\right)^{4 \cdot 6.25}$

$A = \$94{,}529.80$

15. How much money will you have in 6 months if you invest $2000 at 3% compounded monthly?

$A = ?$
$P = 2000$
$r = .03$
$n = 12$
$t = 6$ mth

$A = 2000\left(1 + \frac{.03}{12}\right)^{12 \cdot (6/12)}$

$2030.19

16. You are investing $1500 at 5.2% compounded continuously. How much money will you have in 12 years?

$P = 1500$
$e =$
$r = .052$
t 12

$A = Pe^{rt}$

$A = 1500e^{.052 \cdot 12}$

$A = 2799.57$

17. If you deposit $2500 into an account paying 11% interest compounded quarterly, how long until there is $4500 in the account?

$A = 4500$
$P = 2500$
$r = .11$
$n = 4$
$t = ?$

$4500 = 2500\left(1 + \frac{.11}{4}\right)^{4t}$

between 5-6 years

18. An account earning 6.6% interest compounded continuously for 10 years would have a balance of how much if the principal was $550?

$A = ?$
$P = 550$
e
$r = .066$
$t = 10$

$A = 550e^{.066(10)}$

$A = \$1064.14$

19. A teenager saved small dollar amounts throughout the school year and now has $712. They can choose from two bank offers. The first is 5.3% compounded continuously for six years. The second is compounded quarterly for five years at 6%. Which account will yield the most money? What is the dollar amount difference between the accounts at the end of the terms?

bank 1
$A =$
$P = 712$
$e =$
$r = .053$
$t = 6$

$A = 712e^{.053(6)}$

$A = \$978.56$

yields more $

bank 2
$A(t) = ?$
$P = 712$
$r = .06$
$n = 4$
$t = 5$

$A(t) = 712\left(1 + \frac{.06}{4}\right)^{4 \cdot 5}$

$A = \$958.96$

Difference
978.56 - 958.96
= $19.60

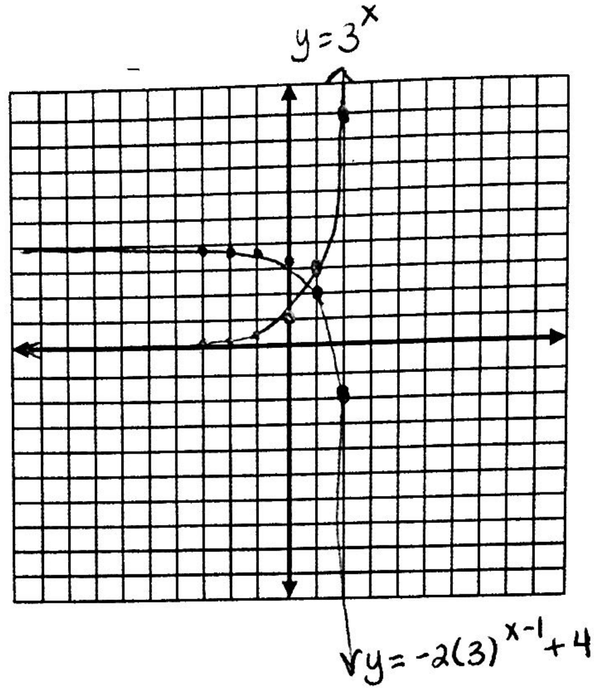
20. How does the graph $y=-2(3)^{x-1}+4$ compare to the graph the parent function $y=(3)^{x}$.

$y=(3)^{x}$

x	y
-3	.03704
-2	$.\overline{11}$
-1	$.\overline{33}$
0	1
1	3
2	9
3	27

$y=-2(3)^{x-1}+4$

x	y
-3	3.9753
-2	3.925
-1	$3.\overline{77}$
0	$3.\overline{33}$
1	2
2	-2
3	-14



	Domain:	Range:	y-int:	Asymptote:	Reflection:	Stretch/ Compression:	Translation:
$y=(3)^{x}$	ℝ	$y>0$	(0,1)	$y=0$	X	X	X
	$(-\infty,\infty)$						
$y=-2(3)^{x-1}+4$	ℝ	$y<4$	(0,3.33)	$y=4$	y- over the x-axis	S: by factor of 2	moves right 1 unit
	$(-\infty,\infty)$	$(-\infty,4)$					moves up 4 units

How does the graph of each function compare to the graph of the parent function?

	Domain:	Range:	y-int:	Asymptote:	Reflection:	Stretch/ Compression:	Translation:
21. $y=-2(3)^{x-1}+4$	ℝ	$y<4$	(0,3.33)	$y=4$	yes- over x-axis	S: factor of 2	right 1 unit up 4 units
	$(-\infty,\infty)$	$(-\infty,4)$					
22. $y=3(10)^{x}$	ℝ	$y>0$	(0,3)	$y=0$	X	S: factor of 3	X
	$(-\infty,\infty)$	$(0,\infty)$					
23. $y=-\frac{1}{4}(5)^{x}-8$	ℝ	$y<-8$	(0,-8.25)	$y=-8$	yes over x-axis	C: factor of 1/4	down 4 units
	$(-\infty,\infty)$	$(-\infty,-8)$					
24. $y=121(.5)^{x+6}$	ℝ	$y>0$	(0,121)	$y=0$	X	S: factor of 121	(decay) moves left
	$(-\infty,\infty)$	$(0,\infty)$					6 units