 Name: _____

4REV.1 ~ End of Chapter Review

Past due on: _____ Period: _____

The grades of six students are given by the formulas below, where time is measured in weeks since the first midterm exam.

$(a)\ G = 85(0.92)^t$

$(b)\ G = 68(0.95)^t$

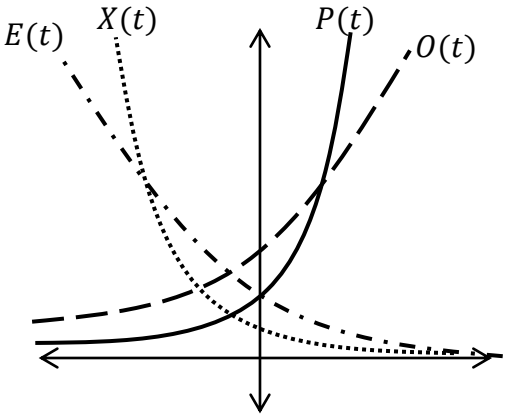
$(c)\ G = 85(1.001)^t$

$(d)\ G = 75(1.005)^t$

$(e)\ G = 93(1.03)^t$

$(f)\ G = 72(0.85)^t$

1. Alex's grade has been decreasing since the first exam. Which formula(s) could represent her grade?
2. Which student's grade is falling the fastest? At what rate is the grade decreasing?
3. Umar's grade has been rising since the first exam. Which formula(s) could represent his grade?
4. Which student's grade is rising the fastest? At what rate is the grade rising?
5. Karen came out of the first exam with an 85%. Which formula(s) could represent her grade?
6. Which function(s) have a value of $b > 1$?
7. Which function(s) have the smallest initial value?
8. Which function increases at the slowest rate?
9. Which function(s) represent exponential decay?
10. Which functions have the same initial value?
11. Which function has the smallest b value?



12. Consider the exponential function $Q(t) = 3.5(1.182)^t - 8$ and identify the following characteristics:

y-intercept	Increasing or decreasing?	Horizontal asymptote	Range	$\lim_{t\to-\infty} Q(t)$	$\lim_{t\to\infty} Q(t)$

Identify the function as linear or exponential. Write a function equation of the form $y = mx + b$ if linear and $y = a(b)^x$ if exponential.

13.

x	y
-1	50
0	10
1	2
2	0.4

14.

x	y
0	35
1	29
2	23
3	17

15.

x	y
0	32
1	28
2	24
3	20

16. A function graph passes through $(-1, 17)$ & $(3, 3)$. Find both a linear function model and an exponential function model. *For the exponential function, round a to 2 decimal places and b to 3 decimal places.*

17. At the start of a study, the size of a particular animal population was 5000. Write the proper function formula – $P = mt + b, P = a(b)^t$, or $P = ae^{kt}$ – for the size of the population, P, in t years since the start of the study.
    a. Rising at a rate of 3.85% annually.
    b. Diminishing at a continuous rate of 16.2% every December 31st.
    c. Declining at a yearly rate of 15.4%.
    d. Escalating at a continuous rate of 22% each year.
    e. Lessening at a constant rate of 40 animals every 52 weeks.
    f. Climbing at a steady rate of 500 animals every twelve months.

18. What are the nominal and effective annual rates of a money market account that pays interest at the rate of 6.4% per year and is compounded monthly? *Round the effective rate to 3 decimal places.*

    How much money is in the money market account 10 years later if $2500 is invested initially?

19. Which is better: an account paying 5.3% interest compounded continuously or an account paying 5.4% interest compounding quarterly? *Justify your answer with mathematics.*

20. At time $t = 0$ years, a species of turtle is released into a wetland. When $t = 4$ years, a biologist estimates there are 300 turtles in the wetland. Three years later, the biologist estimates there are 450 turtles. Find a formula for P, the turtle population assuming exponential growth. *Round a to the nearest whole number and b to 3 decimal places.*

21. In 2000, the population of Gotham City was 2.925 million. After 15 years, the population had increased by 19.2%.
    a. What was the population in 2015? *Do not round.*
    b. Assuming exponential growth, by what percent did the population of Gotham City grow each year? *Round the rate to 2 decimal places.*

22. A 2010 Lexus LS costs $64,680. The car depreciates a total of 42% during its first 5 years.
    a. What is the value of the car after five years? *Do not round.*
    b. Suppose the depreciation is exponential. Find a formula for the value, V, of the car t years after 2010. *Round b to 3 decimal places.*
    c. Suppose the depreciation is linear. Find a formula for the value, V, of the car t years after 2010. *Do not round the slope.*