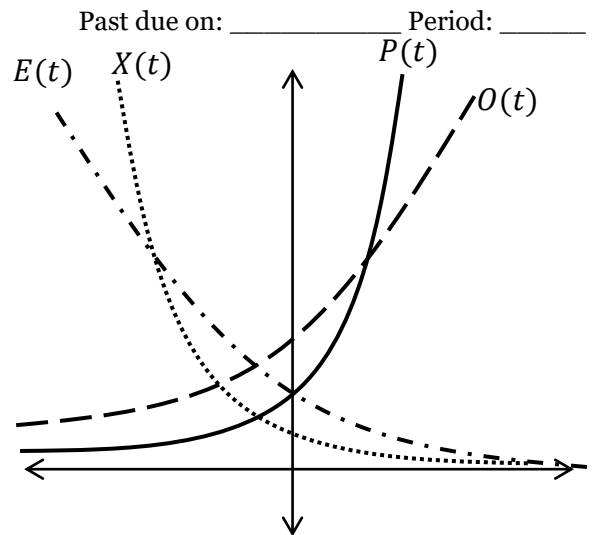


# 6.REV.1 ~ Exponential Functions

- Which function(s) have a value of  $b > 1$ ?
- Which function(s) have the smallest initial value?
- Which function increases at the slowest rate?
- Which function(s) represent exponential decay?
- Which functions have the same initial value?
- Which function is decaying at the fastest rate?



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

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

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.

8.

$x$	$y$
-1	50
0	10
1	2
2	0.4

9.

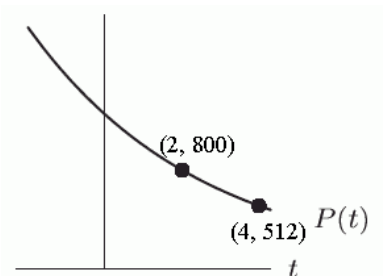
$x$	$y$
0	35
1	29
2	23
3	17

10.

$x$	$y$
0	32
1	28
2	24
3	20

- At the start of a study, the size of a particular animal population was 5000. Write a function formula for the size of an animal population,  $P$ , in  $t$  years since the start of the study.
  - Rising at a rate of 3.85% annually.
  - Diminishing at a continuous rate of 16.2% every December 31<sup>st</sup>.
  - Declining at a yearly rate of 15.4%.
  - Escalating at a continuous rate of 22% each year.
  - Lessening at a constant rate of 40 animals every 52 weeks.
  - Climbing at a steady rate of 500 animals every twelve months.

12. Write an exponential function that represents the graph that is shown.



13. Sales of energy-efficient compact fluorescent lamps in China have been growing exponentially. In 1994, the sales were \$20 million and in 2003 they had increased to \$440 million. What is the percent growth rate? *Round to two decimal places.*
14. 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.*
15. In 2000, the population of Gotham City was 2.925 million. By 2015, the population had increased by 19.2%.
- What was the population in 2015?
  - Assuming a constant growth factor, by what percent did the population of Gotham City grow each year? *Round to two decimal places.*
  - Assuming linear growth, by how many people did the population of Gotham City increase each year?
16. Consider a money market account that pays interest at the rate of 6.4% per year and is compounded monthly.
- What are the nominal and effective annual rates of? *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?
17. 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.