

Come to class Tuesday with the following completed.

- Carefully read the first two sentences of Section 3.1 and complete the blanks:  
Exponential functions change at a constant \_\_\_\_\_,  
while linear functions change at a constant \_\_\_\_\_.
- Notice in Section 3.1, Example 1 how the salary is computed from the previous year's salary.  
Then give the salary for Year 5 (accurate to two decimal places). \_\_\_\_\_
- For the salary function in Section 3.1 Example 1, give the **annual growth factor**: \_\_\_\_\_
- For the salary function in Section 3.1 Example 1, give the **annual growth rate**: \_\_\_\_\_
- Circle True or False:  
The text reports the **growth factor per millenium** of the carbon-14 function from Section 3.1 Example 3 as 0.886, even though it is decreasing.  
 True  
 False
- On page 106, suppose there were a row for  $t = 4$  years in Table 3.4.  
Would the salary would be equivalent to  $40,000(1.06)(1.06)(1.06)(1.06)$ ?  
 Yes  
 No
- The blue box on page 108 is VERY important. Read it carefully.  
Which of these represents the **growth factor**?  
  $a$   
  $b$   
  $t$   
  $f(t)$   
  $r$
- In Section 3.1, which of these functions are concave up? (Select ALL correct answers.)  
 The salary function in Example 1  
 The population of Mexico in Example 2  
 The amount of carbon-14 remaining in Example 3  
 The Yonkers fine in Example 8.
- In Example 8, suppose the fine started out at \$100 but **tripled** every day instead of doubled.  
What would then be the formula in part (b)? \_\_\_\_\_
- The box on page 111 (and discussion preceding it) is important. Complete the blanks below, using any of the words in this list: **sum, difference, product, ratio**  
For linear functions, the \_\_\_\_\_ of consecutive y-values is constant.  
For exponential functions, the \_\_\_\_\_ of consecutive y-values is constant.

The data in Table 3.7 given in the text is shown below.  
 Answer Questions 11-12 about the functions in this table.

$x$	$f(x)$
20	30
25	45
30	60
35	75

$x$	$g(x)$
20	1000
25	1200
30	1440
35	1728

11. One of these functions is linear and the other is exponential.

Select which of the following are true. (Select **ALL** correct answers.)

- $f(x)$  is linear
- $f(x)$  is exponential
- $g(x)$  is linear
- $g(x)$  is exponential

12. True or False: The formula for  $f(x)$  is not shown in the text, but it would be  $f(x) = 3x - 30$ .

Hint: you can check this with a graphing calculator.

13. True or False: The formula for  $g$  is  $g(x) = 1000(1.2)^x$ .

14. In the text, when finding the formula for the exponential function, they solve  $b^5 = 1.2$ .

How do they do this? (Select ONE)

- divide both sides by 5
- multiply both sides by  $1/5$
- raise each side to the  $1/5$  power
- take 5th roots of both sides

15. Pay careful attention to the top of page 113, **Similarities and Differences between Linear and Exponential Functions**, and how the text finds the parameters  $m$  and  $b$  for a linear function  $y = b + mx$  and the parameters  $a$  and  $b$  for an exponential function  $y = ab^x$  when given two points through which they pass. The value of  $b$  in the linear function and the value of  $a$  in the exponential function give the *starting value*. What does the text mean by the **starting value**? Select **ALL** correct answers.

- the value of  $y$  when  $x = 0$ .
- the value of  $x$  when  $y = 0$ .
- the first entry in the table
- the  $x$ -intercept
- the  $y$ -intercept

16. Read Section 3.2 Example 3 thoroughly, produce the graphs on your calculator in appropriate windows, and find the intersection points that they do. For part (c), the text showed that the intersection point occurred when  $t$  was about 102 years (found using the intersection feature shown in class last week). What is this value of  $t$ , accurate to 4 decimal places? 102. \_\_\_\_ \_