

**Objectives Assessed by MA 153 Test 2**  
**Chapter 3 and Chapter 4 (not 4.4)**  
(See also your *eGrade* assignments for more practice)  
Revised

The test cycle for Test 2 is  
Mon October 27 – Fri. Oct 31  
***You must take a credible  
first attempt either Oct. 27 or 28***

1. Given a formula, get an annual growth rate or decay rate, as well as an initial amount.  
**3.1** – 16, 25 and **3.2** – 5, 37 and **3.3** – 16, **Chapter 3 Review** – 2, 45
2. Given an annual growth rate or decay rate and an **initial** amount,
  - a. Write a formula  $y = ab^x$ .
  - b. Predict a future value of  $y$  for some  $x$  and given a value of  $y$ , find a value of  $x$ .  
**3.1** – 1-8, 17-22, 27, 28 and **3.2** – 2, 3, 6-11, 14-17, 35, 36, 38-40 and **3.3** – 15, 18, 31 **Chapter 3 Review** – 1, 4, 7-9, 25-29, 33
3. Given some data (which is not an initial amount).
  - a. write a formula for an exponential function
  - b. Know what  $a$  and  $b$  mean in the formula  $y = ab^x$ .
  - c. Predict a future value of  $y$  for some  $x$  and given a value of  $y$ , find a value of  $x$ .  
**3.2**- 18-29, 31, 33, and **Chapter 3 Review** – 10, 11, 16-19, 22-24, 33,
4. Match an equation to a graph. Know what  $a$  and  $b$  (or  $k$ ) mean in  $y = ab^x$  or  $y = ae^{kx}$ .  
Understand general shape, concavity, domain, range, asymptotes, etc.  
**3.3** – 13, 14, 20, 21, 22, 23, 30, 34 and **3.4** – 1, 2, 5, 13, 14 **Chapter 3 Review** – 5, 6
5. Use the compound interest formula  $A = P(1 + \frac{r}{n})^m$  or  $A = Pe^{rt}$  appropriately to
  - a. Find one value if given the other values.
  - b. Find the annual growth rate (effective annual yield).  
**3.4** – 7-10, 15, 16-20, 21, 27-30 and **Chapter 3 Review** – 15
6. Understand and use logarithms:
  - a. Write a statement involving exponential form into logarithmic form and vice versa.
  - b. Understand the inverse properties  $e^{\ln W} = W$  and  $\ln e^W = W$  or  $10^{\log W} = W$  and  $\log 10^W = W$   
  
Be able to write something like  $\frac{1}{\sqrt{e^x}} = e^{-x/2}$  and then find  $\ln\left(\frac{1}{\sqrt{e^x}}\right) = \ln e^{-x/2} = -\frac{x}{2}$
  - b. Know how to evaluate a logarithm such as  $\log_2 16$ . (See worksheet on logs).
  - c. Understand and use power property (Bob Barker property) and sum and difference properties of logs.  
**4.1** – 1-10, 19-29, 49-51 and **Chapter 4 Review** 19-21, 31 and worksheet on logarithms
7. Solve an exponential equation for exact solutions (and approximate solutions)
  - a. with  $x$  on one side of the equation. See **4.1** 11-13, 40 and **Chapter 4 Review** – 7, 8
  - b. with  $x$  on one side – multistep See **4.1** #14-18, 32, 35, 36, 41, 43-45 **Ch 4 Review** 9, 10, 16, 26b, parts of 32
  - c. with  $x$  on both sides of the equation. See **4.1** #33, 42, 46 and **4.2** #24, 37, 44, 45 and **Ch 4 Review** – 17, 23, 24
8. Given an initial amount and a growth rate over some period of time,
  - a. write a formula for an exponential function
  - b. determine half-life or doubling or tripling time
  - c. determine the growth rate per period of time  
**4.2** – 1-19, 23, 36, 43, 49 and **Chapter 4 Review** 11, 26
9. Solve a logarithmic equation (and use  $\text{pH} = -\log[\text{H}^+]$ ). See **4.1** 34 and **4.3** 13-17, 30, 32a and **Ch 4 Rvw** 32de
10.
  - a. Recognize linear vs. exponential growth
  - b. Find formulas for linear functions and exponential functions if given its initial value and information on how it grows.
  - c. Solve an equation involving an exponential function and a linear function.  
Read page 114 **Exponential Growth Will Always Outpace Linear Growth in the Long Run** and read bottom of page 156 **Exponential Growth Problems That Cannot Be Solved By Logarithms** and do **3.2** --32 and **4.2** – 26, 27 and **Chapter 4 Review** 32gi
11. Understand general shape, concavity, domain, range, asymptotes, etc. of the graph of  $y = \log x$  or  $y = \ln x$ .  
**4.3** – 1-6, 19

Start Your Review by doing the following:

**Check Your Understanding Chapter 3** (page 137): 1-20, 24-32

**Check Your Understanding Chapter 4** (page 179): 1-22