

## Objectives Assessed by MA 153 Test 2

### Chapter 3 and Chapter 4 (not 4.4)

Tuesday, Oct. 27

- Given a formula, get an annual growth rate or decay rate, as well as an initial amount.  
**3.1** – 16, 26 and **3.2** – 1, 38 and **3.3** – 16, **Chapter 3 Review** –11
- Given an annual growth rate or decay rate and an **initial** amount,
  - write a formula  $y = ab^x$  or
  - predict a future value of  $y$  for some  $x$  and given a value of  $y$ , find a value of  $x$ .  
**3.1** – 1-4, 21-25, 27-31, 33, 34 and **3.2** – 2, 3, 6-9, 11, 14, 18-20, 36, 37,39-41 and **3.3** – 15, 18, 38 and **Chapter 3 Review** – 10, 13-15, 47-49, 50
- Given some data (which is not an initial amount).
  - write a formula for an exponential function
  - Know what  $a$  and  $b$  mean in the formula  $y = ab^x$ .
  - Predict a future value of  $y$  for some  $x$  and given a value of  $y$ , find a value of  $x$ .  
**3.2**- 5, 15-17, 21-23, 26-29, 31, 33, 34 and **Chapter 3 Review** – 16, 17, 34-37, 43-45, 50
- 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** – 3, 4, 19, 24, 25, 26, 37, 41 and **3.4** – 1, 2, 5, 6 and **3.5** – 5 **Chapter 3 Review** – 19, 20
- Use the compound interest formula  $A = P(1 + \frac{r}{n})^{nt}$  or  $A = Pe^{rt}$  appropriately to
  - Find one value if given the other values.
  - Find the annual growth rate (effective annual yield).  
**3.4** – 8, 9, 15, 16 and **3.5** – 7, 8, 11-14, 16, 18-20, 24 and **Chapter 3 Review** – 32
- Understand and use logarithms:
  - Write a statement involving exponential form into logarithmic form and vice versa.
  - 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  $\ln\left(\frac{1}{\sqrt{e^x}}\right) = \ln e^{-x/2} = -\frac{x}{2}$
  - Know how to evaluate a logarithm such as  $\log_2 16$ . (See worksheet on logs).
  - Understand and use power property (Bob Barker property) and sum and difference properties of logs.  
**4.1** – 1-10, 19-21, 23-30, 54 and **Chapter 4 Review** 27-29, 46 and worksheet on logarithms
- Solve an exponential equation for exact solutions (and approximate solutions)
  - with  $x$  on one side of the equation. See **4.1** 11-13, 40 and **Chapter 4 Review** – 7, 8
  - with  $x$  on one side – multistep See **4.1** #14-18, 34, 37, 38, 41,43-45 **Ch 4 Review** 9, 10, 22, 41b, parts of 47
- Given an initial amount and a growth rate over some period of time,
  - write a formula for an exponential function
  - determine half-life or doubling or tripling time
  - determine the growth rate per period of time  
**4.2** – 9-16, 19-27, 34, 48 and **Chapter 4 Review** 13, 41
- Solve a logarithmic equation (and use  $\text{pH} = -\log[\text{H}^+]$ ). See **4.1** 36 and **4.3** 13-17, 32, 34a and **Ch 4 Rvw** 47de
- Recognize linear vs. exponential growth
  - Find formulas for linear functions and exponential functions if given its initial value and information on how it grows.
  - Solve an equation involving an exponential function and a linear function.  
Read page 118 **Exponential Growth Will Always Outpace Linear Growth in the Long Run** and read bottom of page 163 **Exponential Growth Problems That Cannot Be Solved By Logarithms** and do **3.2** --30 and **4.2** – 38, 39 and **Chapter 4 Review** 47gi
- Understand general shape, concavity, domain, range, asymptotes, etc. of the graph of  $y = \log x$  or  $y = \ln x$ . **4.3** – 1-6, 21

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