

Objectives Assessed by MA 153 Test 2
Chapter 3, Chapter 4 (not 4.4) and Chapter 5 (not 5.4)

(See also your *eGrade* assignments for more practice)

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 $y = ab^x$ or
 - 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 and **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 $A = P(1 + \frac{r}{n})^{nt}$ 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 $\ln\left(\frac{1}{\sqrt{e^x}}\right) = \ln e^{-x/2} = -\frac{x}{2}$
 - c. Know how to evaluate a logarithm such as $\log_2 16$. (See worksheet on logs).
 - d. 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
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

12. Understand vertical and horizontal shifts of a function as an outside/inside *additive* change to the function rule.
Section **5.1** #3-25, 31-32, 35, 39, 40 and **Chapter 5 Review** #1-4, 19, 20, 23, 24, 30, 31, 35ad
13. Understand vertical or horizontal reflections of a function as an outside/inside change to the function rule *by a negative sign*.
Be able to combine these with shift transformations.
Section **5.2** #2-17, 22, 23, 26, 27 and **Chapter 5 Review** #1-4, 19, 21, 22, 27, 28, 29, 31
14. Identify whether a function is odd, even, or neither by looking at its graph, equation or table.
Section **5.2** #18-21, 30, 32, 33, 40 and **Chapter 9 Review** 23abcdefg and 25
15. If given that a function is odd or even and a point on its graph, determine another point.
Section 5.2 #28, 29 and **Chapter 5 Review** #5-11
16. Understand vertical stretch or compression of a function as an outside *multiplicative* change to the function rule.
Be able to combine these with reflections and shift transformations.
Section 5.3 #31-16, 20, 21-24, 28 and **Chapter 5 Review** #1-4, 19, 25, 35e, 36
17. Understand the standard form, vertex form, and factored form of a parabola. Convert from standard form to vertex form by completing the square or using a grapher and a shift transformation. **Section 5.5** # 10-13, 15, 16, 18, 19
18. Find the vertex, axis of symmetry, concavity, whether the graph is narrower, wider, or same shape as $y = x^2$, if given its equation. Be able to sketch without a graphing calculator.
Section 5.5 #9-18, 20, 21, 25, 28 and **Chapter 5 Review** # 48
19. Find a quadratic model if given its zeros or its vertex and at least one other point.
Section 5.5 #3-8, 14 and **Chapter 5 Review** #13-16

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

Check Your Understanding Chapter 5 (page 225): 1-21, 24-29