

Learning Outcomes Assessed by MA 153 Test 1, Thursday, February 12
Chapter 1 (not 1.6) and Section 2.1, 2.2, 2.5, 2.6

The exam will be aligned to the following MA 153 Course Goals and assess the following learning outcomes.

- Highlight the link of mathematics to the real world.
 - Develop a wide base of mathematical knowledge, including
 - basic skills and concepts,
 - a functional view of mathematics, including graphical, algebraic, numerical, and contextual viewpoints,
 - properties and applications of some of the basic families of functions
 - geometric visualization,
 - problem solving, predicting, critical thinking, and generalizing.
 - Incorporate the use of general academic skills such as
 - communicating mathematics concepts, and
 - understanding and using technology
1. Demonstrate correct use of function notation. Identify the independent and dependent variable and label the correct variable on the appropriate axis. **Section 1.1** #1-15, 32, 33, 42-44
 2. Determine if a graph, table, formula, or a verbal description is a function. **Section 1.1** #16-26, 40, 41 and **Example 6** on page 5 and Ch 1 Rvw #1-3, 6,
 3. Use the Rule of Four to sketch a function's graph from a verbal description or match its table to its graph or story. **Section 1.1** # 27-29
 4. Identify intervals (if any) on which a function is increasing and decreasing
Section 1.2 #1-5, 17, 25 and **Example 1, 2, 3** on pp 11-12
 5. Determine and interpret the value of the average rate of change from a table of values, a graph, or a formula of a function. **Section 1.2** #5-8, 19,20, 22, 24, 31 and **Example 2 and 4** on pp 12-14
 6. Interpret the average rate of change of a function $f(x)$ on an interval from $x_1 = a$ to $x_2 = b$ as the slope of a segment which connects points $(a, f(a))$ and $(b, f(b))$, where $\frac{\Delta y}{\Delta x} = \frac{f(b)-f(a)}{b-a} = \frac{y_2-y_1}{x_2-x_1}$. Read the box on page 13. **Section 1.2** #9-14, 20, 28
 7. Given the formula of a linear function, find and interpret its slope and axis intercepts as well as sketch its graph. **Section 1.3** #10-16, 22, 28, 29 and **Section 1.4** #47-54
 8. Find a linear model if given an initial value and an average rate of change (or slope). **Section 1.1** #46 and **Section 1.3** - #17, 18, 19, 22, and **Section 1.4** #2, 39,, 57 and **Section 1.5** #31, 32 and **Chapter 1 Review** #
 9. Find a linear model if given any value (not necessarily its initial value) and an average rate of change (or slope). **Section 1.3** # 22, 28 and **Section 1.4** #1, 2, 4, 6, **Section 1.5** # 10,11,
 10. Find a linear model if given any two points. **Section 1.4** #3, 5, 7-15, 37, 38, 40, 50, 52-54, 60, 61 **Section 1.5** #28
 11. Determine if a table of values of a function represents linear growth or linear depreciation.
Section 1.3 #4-9, 14, 15 and **Section 1.4** #45 **Ch 1 Review** # 9,10
 12. Understand the geometric properties of linear functions including:
 - when two lines are parallel and when they are perpendicular
 - when their y-intercepts are positive or negative
 - when they are increasing or decreasing (or neither)**Section 1.4** # 31-36, 42-44, 46, and **Section 1.5** #1-4, 8, 9,18, 19
 13. Construct linear models and find intersection points to solve problems and make predictions.
Section 1.5 # 10, 11, 16, 28 and **Example 3** on pp 39-40
 14. Evaluate functions with values that are *expressions* as well as *numbers*.
Section 2.1 #1-34, 40-42, 44 and **Chapter 2 Review** #1 – 12, 20, 21 49, 52, 53, 54
 15. Solve equations and inequalities algebraically and graphically. Interpret the results.
Section 2.1 #1-34, 40-42, 44 and **Chapter 2 Review** 66, 67
 16. Determine the domain and range of a function if represented by a graph, table, formula, or verbal description.
Section 2.2 #1-29 , 31 and **Chapter 2 Review** #15-19, 72, 73
 17. Use a graphing calculator to graph a function in an appropriate viewing window. Use built-in calculator features such as an intersection point finder, maximum/minimum finder, or zero finder to solve problems. **Section 1.3** #32-36
 18. Interpret expressions or equations which involve function notation and inverse function notation.
Section 1.1 #35 and **Section 1.3** # 29 and **Section 2.5** -- 1-59 and **Chapter 2 Review** 34-35, 56, 58,59, 60, 62, 63, 65, 68
 19. Determine the concavity of a function. **Section 2.6** #1-27 and **Chapter 2 Review** 55

Start your review by doing the following:

Strengthen Your Understanding Chapter 1 (page 60): 1-45

Strengthen Your Understanding Chapter 2 (page 113-114): 1-18, 30-37, 41-46