

For the definitions and theorems listed below, you need to be able to use them and explain them in your own words. Unless otherwise noted, you do *not* need to memorize definitions and theorems verbatim.

Chapter 1

- Be able to find limits
- Know the definition of continuity

2.1 & 2.2 Definition of the Derivative & Rates of Change

- Know how to interpret the derivative at a given x -value as a slope or a rate of change.
- Know the limit definition of the derivative function.
- Write the equation of the tangent line to the graph of $y = f(x)$ at a particular point.
- Know that if $s(t)$ is position, the velocity is $v(t) = s'(t)$ and acceleration is $a(t) = v'(t) = s''(t)$.
- Be able to sketch f' , given the graph of f .
- Be able to describe where f is increasing or decreasing, based on the graph of $f'(x)$.

2.3 – 2.5 Differentiation Rules

Terms to know:

- Differentiation rules: constant rule, power rule, constant multiple rule, sum & difference rule, product rule, quotient rule, chain rule.

Be able to:

- Find the derivatives of functions using the differentiation rules.
- Find the velocity and acceleration functions, given the position function of an object.
- Answer questions using the position, velocity, and acceleration functions.
- Find higher-order derivatives.
- Illustrate the derivative of a constant function using a graph.
- Describe in words what the product rule, quotient rule and chain rule say. Be able to explain how to use these rules.
- Find derivatives of products, quotients or compositions using a graph or a table (see problems 49 – 52 on p. 120)
- Prove $\frac{d(\cos x)}{dx} = -\sin x$

2.6 & 2.7 Implicit Differentiation and Related Rates

Be able to:

- Find the derivative of an implicitly-defined function.
- Write the equation of the tangent line to the graph of an implicitly-defined curve.
- Find the points on an implicitly-defined curve where the tangent line is horizontal or vertical, or where the tangent line has a specified slope.
- Set up and solve a related rates problem.
 - * follow the strategy and clearly show all steps and state the answer.

3.1 Exponential Functions

Terms to know:

- Exponential function; base of an exponential
- Natural exponential function; e
- Laws of exponents

Be able to:

- Find domains and ranges of exponential functions
- Find limits of exponential functions
- Sketch graphs of translated exponential functions.

Review Problems

p.138 Concept check: 1, 2, 3, 5, 8, 9, 10

pp. 138 – 139 True-False Quiz: 1, 2, 3, 4, 5, 6, 7, 8, 10

pp. 139 – 141 Exercises: 1, 3, 4, 7, 13 – 38, 41, 43 – 46, 47, 48, 49, 50, 51, 53, 57, 62, 63, 65, 66, 67

p. 195 Concept Check: 2b, c, 3a

True-False Quiz: 6, 7

pp. 196 – 197 Exercises: 5, 6, 67, 69, 72

****Important:** Spend time reviewing concepts as well as doing practice problems. Look at definitions and theorems in the class notes and in the book. Try to state them in your own words and see how they connect to each other.