

Honors Calculus

Differentiation

The list below contains the specific *learning targets* for the unit on differentiation. Before the unit test, you should be able to place a check next to each statement as being true.

- I can describe the concept of a numerical derivative in my own words.
- I can use limits to find derivatives analytically.
- I can find the tangent line to a curve at a specific point.
- I can describe the derivative of a function given the graph of that function.
- I can define differentiability at a point.
- I can describe common types of non-differentiability in the graph of a function.
- I can use derivatives to describe rates of change.
- I can find higher-order derivatives.
- I can differentiate basic functions, including polynomial and trigonometric functions.
- I can differentiate functions involving products and quotients.
- I can perform the Chain Rule to differentiate composed functions.

Textbook Assignments

The exercises below are from *Calculus of a Single Variable, 7th edition*, by Larson, Hostetler, and Edwards. These specific problems are the bare minimum that should be completed after each lesson, but you are encouraged to attempt more if needed.

- 2.1 Numerical Derivatives **pg 101: 7, 17, 21, 23, 27, 31**
- 2.1 Differentiability **pg 101: 39-42, 63, 66, 67, 72, 73, 75, 77, 79, 85**
- 2.2 Basic Derivative Rules **pg 113: 7, 15, 21, 37, 39, 43, 47, 56, 57**
- 2.2 Rates of Change **pg 113: 89-94, 95, 97, 101-103, 105, 106**
- 2.3 Product and Quotient Rules **pg 124: 1-17 (odd), 25, 29, 65, 69, 75, 78, 95-98**
- 2.3 Higher-Order and Trigonometric Derivatives **pg 124: 39-53 (odd), 67, 83, 85, 91, 99**
- 2.4 Chain Rule **pg 133: 11, 13, 15, 21, 47, 49, 51, 65, 67, 78, 89**
- 2.4 Chain Rule **pg 133: 25, 29, 31, 53, 57, 59, 79, 93, 95, 101**