Calculus 120, Chapter 1 Summary ~ things you should know

notes by Tim Pilachowski

Important concepts:

slope of a curve at a point = slope of line tangent to the curve at that point = (instantaneous) rate of change of the curve at that point = first derivative evaluated at that point.

notations for first derivative: $f'(x)$, y', $\frac{d}{dx}[f(x)]$ and $\frac{dy}{dx}$

power rule, general power rule, constant-multiple rule, sum rule

notations for second derivative: $f''(x)$, y'', $\frac{d^2}{dx^2}[f(x)]$ and $\frac{d^2y}{dx^2}$

average rate of change vs. instantaneous rate of change

velocity as first derivative of a distance function

marginal cost, marginal revenue, and marginal profit as first derivatives of cost, revenue and profit functions respectively

Be able to:

find slope, intercepts and equation of a line

find slope of a curve at a point

given a function, find the correct formula/equation/algebraic rule for first and second derivative

evaluate a function, a first derivative, and a second derivative at a specified value of x

use power rule, general power rule, constant-multiple rule, sum rule

given two points, find an average rate of change

use first derivative and difference quotient to estimate the value of a function at a specified value for x

Review exercises from the text (13th edition):

Chapter 0 Supplementary Exercises, numbers 1 – 44 (answers to odd-numbered problems are in the back)

Chapter 1 Review of Fundamental Concepts, numbers 1 – 9 and 15 – 22

Chapter 1 Supplementary Exercises, numbers 1 – 76 (answers to odd-numbered problems are in the back)