Math 10A Final Exam Study Guide/Practice Exam

Topics, Suggested Problems

1. Limits of functions
   a. At a point (1.8) 1.R.33, 2.1.19
   b. At infinity (1.8) 1.8.31

2. Continuity and differentiability
   a. Continuity (1.7) 1.7.19
   b. Differentiability (2.6, 3.10) 2.6.10, 3.10.4

3. Average and instantaneous rates of change, derivative at a point, derivative function
   a. Average rate of change (2.1) 2.1.3a
   b. Derivative at a point or instantaneous rate of change, limit definition (2.2) 2.2.37
   c. Derivative function, limit definition (2.3) 2.R.7
   d. Estimating instantaneous rate of change or derivative at a point (2.2) 2.1.3b
   e. Estimating derivative function (2.3) 2.R.18c

4. Graphs of function and their derivatives
   a. Graphs of functions (2.3) 2.R.21, 2.5.19
   b. Graphs of derivatives (2.3) 2.5.21
   c. Graphs of second derivatives (2.5) 4.1.39


6. Tangent lines and approximating functions
   a. Tangent lines and local linearizations (3.9) 3.9.6, 3.9.71
   b. Estimating functions values and determining if they are overestimates or underestimates (3.9) 3.9.12
   c. Newton’s method for approximating zeros (App. C) Example 2

7. Maxima and minima
   a. Critical points (4.1) 4.3.3a, 4.R.25
   b. Determine if critical points are local maxima or local minima using FDT or SDT (4.1) 4.1.29, 4.R.15, 4.R.25
   c. Find global maxima and minima on closed and open intervals (4.3) 4.R.5, 4.R.11, 4.3.11

8. Optimization
   a. Families of curves (4.2) 4.2.23, 4.2.27, 4.2.33ab
   b. Maximizing profit (4.4) 4.4.15, 4.4.23abc
   c. Modeling and optimization (4.5) 4.5.19, 4.5.27, 4.R.35

9. Related rates of change (4.6) 4.6.7, 4.6.15, 4.R.51