

Math 134, Fall 2014, Homework 6

The problems are from Calculus, One and Several Variables, 10th Edition by Salas, Hille and Etgen.

For practice - do not hand in

Section 5.2, Problems 11, 12, 19, 25-30.

Section 5.3, Problems 6, 12, 28.

Section 5.4, Problems 6, 11, 22, 35, 47, 54, 56, 64.

Section 5.5, Problems 19, 25.

Section 5.6, Problems 6, 18, 20, 28, 32, 39

Section 5.7, Problems 8, 20, 32, 58.

To hand in

Look at the supplement on uniform continuity and do the following:

1. Prove that the function $f(x) = x^2$ is continuous on the real line, i. e. it is continuous at every real number c .
2. Prove that the function $f(x) = x^2$ is not uniformly continuous on the real line.
3. Prove that the function $f(x) = 2x + 5$ is uniformly continuous on the real line.

Section 5.2, Problems 32

Section 5.3, Problem 36.

Also, prove Theorem 5.3.1 using induction on the number of elements in Q which are not in P . The base case is when $n = 0$. For the induction step, you can use the Lemma in the supplement about this theorem or you can come up with your own argument.

Section 5.5 Find the slope of the line through the origin which divides the area under the parabola $y = 4x - x^2$ and above the x -axis into two equal parts.

Section 5.6, Problem 48.

Section 5.7, Problem 82. Also use $\sin(2\theta) = 2 \sin \theta \cos \theta$ to get a third answer.