Information on Math 571. Spring 2009.
Synopsis of topics on uniform convergence Sections 17,24.

Sequences of functions. Definition of uniform convergence (Definition 17.4). Examples.

The uniform norm (definition (17.5)) Limit of uniformly converging sequence of continuous functions (Theorem 24.1).

Weierstrass Approximation Theorem (Theorem 24.8).

Homework problems: Section 17(p.122) 17A, 17B, 17C, 17D, 17F, 17K, 17L, 17P, 17Q Section 24(p.173) 24A, 24B, 24D, 24E

Exam (Quizzes) problems - examples.

1. Consider sequence $f_n(x) = xe^{-nx^2}$. Does it converge uniformly on $\mathbb{R}$?

2. Consider a sequence

$$f_n(x) = \frac{x^n}{1+x^{2n}} \quad D := \{x \ : \ x \geq 0\}$$

Does it (a) converge on D; (b) converge uniformly on D; (c) converges uniformly on $[2, +\infty)$?

3. Consider a sequence

$$f_n(x) = \frac{nx}{1+n^2x^2} \quad D := \mathbb{R}$$

Does it (a) converge on D; (b) converge uniformly on D; (c) converge uniformly on $[\delta, +\infty)$ for any $\delta > 0$?