

**Topics for Exam 2****1. Consequences of Completeness**

1.1 Archimedean Property

1.2 Density of the rational numbers in the set of real numbers

**2. Sequences of Real Numbers**

2.1 Definition of convergence and limit of a sequence

2.2 The Squeeze Theorem for sequences

2.3 Bounded, monotone convergence theorem

2.4 Subsequences

2.5 Cauchy sequences

**Relevant chapters and sections in the text:**

Section 4.6, Chapter 5, Section 6.1 and Sections 9.2-9.5.

**Relevant Assignments:**

Assignments 7 through 12.

**Relevant Problem Sets:**

Problem Sets 4 through 6.

**Important Concepts:**

Completeness, denseness of rational numbers in the set of real numbers, convergence, Cauchy criterion, monotone and bounded sequences.

**Important Results:**(1)  $\mathbb{Q}$  is dense in  $\mathbb{R}$ : Problem 3 in Problem Set #4(2) *The Squeeze theorem for sequences*: Problem 2 in Problem Set #5(3) *Bounded, monotone convergence theorem*: Problem 9 in Problem Set #5**Important Skills:**

(i) Know how to prove whether a given sequence converges.

(ii) Know how to apply the Squeeze Theorem for sequences.

(iii) Know how to apply the bounded, monotone convergence theorem.