

# Math 409-502

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## Reminder

Second examination is Monday, November 1.

The exam will have a similar format to the format of the first exam.

The exam covers material through section 13.4.

Daylight Saving Time ends this weekend:  
set your clock back one hour.

## Properties of continuous functions

A continuous function on a compact interval

- is bounded;
- attains a maximum value and attains a minimum value;
- has the intermediate-value property.

Put together, these properties say that the range is a compact interval.

## Preview of coming attraction

After the exam, we will see in section 13.5 that another item can be added to the list: a continuous function on a compact interval is *uniformly continuous*.

## Examples related to exercise 13.1/1

A union of compact intervals can be a non-compact interval.

**Example 1:**  $\bigcup_{n=1}^{\infty} [\frac{1}{n}, 1] = (0, 1]$

**Example 2:**  $\bigcup_{n=1}^{\infty} [0, n] = [0, \infty)$

## Power series are continuous functions

If the series  $\sum_{n=1}^{\infty} a_n x^n$  has radius of convergence  $R$ , then this series is a continuous function on the open interval  $(-R, R)$ .

## **Homework**

Study for the examination.