MA104 Lesson 5

Continuity

Tuesday, 22 January, 2008

Outline

- Admin
- Last Class
- Continuity
  - Course Guide
  - Continuity
    - Definitions
    - An Example Problem
  - Continuity and Limits of Functions
- Look Forward - Derivatives and Rates of Change
  - Course Guide

Admin

1. B Hour - Sorry, my answer was wrong on the quiz. Guess what? You get a freebie

Admin

2. **I will not cover the Intermediate Value Theorem, but I will quiz you on it. Learning this concept is up to you as part of the course directors guidance.**

Admin

2. **I will not cover the Intermediate Value Theorem, but I will quiz you on it. Learning this concept is up to you as part of the course directors guidance.**
3. **Solution Manual is in TH226. If you are stuck on homework or do problems go to TH226 and look at the solution manual.**

Birthday Cadet

Who's Birthday is It?

Birthday Cadet

Who's Birthday is It?

1. This cadet is from a city in Illinois!

Birthday Cadet

Who's Birthday is It?

2.

Birthday Cadet

Who's Birthday is It?

3. Yes it is Glasford, Illinois

Birthday Cadet

1.

Birthday Cadet

2. This cadet is involved with the crew team

Birthday Cadet

3.

Birthday Cadet

4. Christopher Barger is 19 today

Birthday Cadet

Who's Birthday is It?

Birthday Cadet

Who's Birthday is It?

1. This cadet is from a city in Hawaii!

Birthday Cadet

Who's Birthday is It?

2.

Birthday Cadet

Who's Birthday is It?

3. Yes it is Honolulu Hawaii

Birthday Cadet

1.

Birthday Cadet

2. This cadet is involved in the war games committee

Birthday Cadet

3.

Birthday Cadet

4. David Park is 19 today!

Limit of a Function II

Questions?

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Objectives

1. Understand the mathematical and geometric definitions of continuity.
2. Determine if a function is continuous, both at a point and on an interval.
3. Understand the three different types of discontinuities at a point: removable, jump, and infinite.
4. **Understand the Intermediate Value Theorem and its applications.**

READ

1. Stewart: Section 2.5, pages 119-127.
2. Student Notes.

THINK ABOUT

1. Why is it important for a function to be continuous?
2. What is the difference between a function being continuous at a point and a function being continuous on an interval?
3. What is an example of a discontinuous quantity in your life?
4. **What is useful about the Intermediate Value Theorem? How can we use it?**

DO Problems

1. Section 2.5/ 3, 4, 7, 8, 16, 37

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Definitions

1. Student notes on continuity.

An Example Problem

1. Book 2.5.41 and 2.5.42

An Example Problem

1. A student parking lot at a regular university charges \$2 for the first half hour (or any part) and \$1 for each subsequent half hour (or any part) up to a daily maximum of \$10. Sketch a graph of cost as a function of the time parked. Discuss the significance of the discontinuities in the graph to a student who may park there.

An Example Problem

1. A student parking lot at a regular university charges \$2 for the first half hour (or any part) and \$1 for each subsequent half hour (or any part) up to a daily maximum of \$10. Sketch a graph of cost as a function of the time parked. Discuss the significance of the discontinuities in the graph to a student who may park there.
2. Find the values of the constants k and m, if possible, which will math the following function

$$\{x^2 + 5, \quad x > 2\}$$

$$\{m(x+1) + k, \quad -1 < x \leq 2\}$$

$$\{2x^3 + x + 7, \quad x \leq -1\}$$

continuous everywhere

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Continuity and Limits of Functions

How does it tie together?

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Lesson 6 - Derivatives and Rates of Change

1. OBJECTIVES:
   1.1 Find the slope of a line tangent to a curve at a point using the limiting value of the slopes of the secant lines.
   1.2 Understand the relationship between average rate of change and instantaneous rate of change graphically, numerically, and algebraically.
   1.3 Know and understand the definition of the derivative at a number.
2. READ:
   2.1 Stewart: Section 2.7, pages 143-150.
   2.2 Student Notes.
3. THINK ABOUT:
   3.1 Given the graph of a function, how would you approximate the instantaneous rate of change of the function at a point?
4. DO:
   4.1 Section 2.7/ 3, 13, 16, 22, 41

Questions?

Questions?