

# MA104 Lesson 2

## Limit of a Sequence

Tuesday, 15 January, 2008

# Outline

Admin

Last Class

Limit of a Sequence

**Course Guide**

**My Take on Limits of a Sequence**

Sequences

Look Forward

**Course Guide**

# Board Work To Warm You Up

## Take Boards!

1. DO Stewart problem 11.1.24
2. DO Stewart problem 11.1.49

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4. B hour will meet on Wednesday 16 January and not on Friday 18 January so I can go to the doctor! This means we will have a quiz for B hour on Thursday 17 January in B hour!

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5. C and D hour will have a drop on Wednesday 16 January!

# Birthday Cadet

Who's Birthday is It?

# Birthday Cadet

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1. This cadet is from a city in Ohio!

# Birthday Cadet

Who's Birthday is It?



2.

# Birthday Cadet

Who's Birthday is It?

3. Yes it is Mogadore, Ohio

# Birthday Cadet

1. Mogador is an Arabic word for beautiful

# Birthday Cadet

2. This cadet is on the volley ball team

# Birthday Cadet

3.



# Birthday Cadet

4. Amanda Rowell turned 19 on 12 January

# Intro to Calculus and instantaneous rate

Questions?

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# Objectives

1. Understand what it means for a sequence to have a limit.
2. Find the limiting value of a given sequence graphically, algebraically, and numerically.

# READ

1. Stewart: Section 11.1, pages 675-679 (Stop at The Squeeze Theorem).
2. Student Notes.

# THINK ABOUT

1. What does it mean for a sequence to converge?
2. Can you come up with a sequence that does not converge?

# DO Problems

1. Section 11.1/ 1, 2, 17, 24, 44, 49

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# Sequences

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$$a_1, a_2, a_3, a_4, a_5, \dots, a_n, \dots$$

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3. When dealing with infinite sequences each term  $a_n$  will have a successor  $a_{n+1}$ .
4. The sequence  $\{a_1, a_2, a_3, \dots\}$  can also be written as:

$$\{a_n\} \quad \text{or} \quad \{a_n\}_{n=1}^{\infty}$$

# Examples of Sequences

1.  $\left\{ \frac{n}{n+1} \right\}_{n=1}^{\infty}$

2. More good examples on page 675 in your text book

## A problem using the limit of a sequence

- ▶ The New England Patriots are 1st and goal on the San Diego Chargers 10 yard line. Chargers from that point on keep committing penalties resulting in endless half the distance to the goal penalties.

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## A problem using the limit of a sequence

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- ▶ How about  $10 * a_n$  where  $a_n = \left\{ \frac{1}{2^n} \right\}_{n=1}^{\infty}$

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- ▶ Look at this Algebraically, Graphically, and Numerically
- ▶ Does this converge or diverge and to what number?

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## 1. OBJECTIVES:

- 1.1 Understand what it means for a function to have a limit.
- 1.2 Approximate the limit of a function using graphic and numeric means.
- 1.3 Approximate the left and right-hand limits of a function.

## 2. READ:

- 2.1 Stewart: Section 2.2, pages 88-94 (stop at Infinite Limits).
- 2.2 Student Notes.

## 3. THINK ABOUT:

- 3.1 What does it mean for an approximation to be "good enough"?
- 3.2 When approximating a quantity, how do we determine if our approximation is sufficient?

## 4. DO:

- 4.1 Section 2.2/ 4, 7, 13, 19

Questions?

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