



# *IBL CALCULUS*

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- Project NeXT National Fellow (Sun dot)
- Assistant Director for the Academy of IBL
- User of IBL since 2007
- Ultra marathon runner

# What is IBL/active learning?

- Here you all briefly share what you know about IBL and/or active learning.

## IBL Experience

- Courses for developing proof skills
- Courses for future teachers
- Courses for practicing teachers
- Outreach for students
- Outreach for teachers

# Why IBL calculus, if it is so “hard”?

- Nationwide calculus study
- Calculus is considered the “gateway” course for many STEM disciplines
- Many students are NOT successful in Calculus I, and of those that are, many struggle in Calculus II
- Desire to increase the quantity and quality of future math teachers

# What does IBL Calculus mean?

- Students are *activity engaged*
- Few traditional lectures are given
- Activities selected to guide students into developing their own understandings

# What did IBL Calculus look like for me?

- The classroom – START with a room well-suited for group work – tables!
- Little introduction – worksheets distributed regularly with students working together
- Traditional University Calculus textbook

# Group Structure

- Depends on instructor
- Me - students self-select groups at the beginning of the semester
  - Shop around for 1-2 weeks before picking groups
- Others - switch on some consistent basis



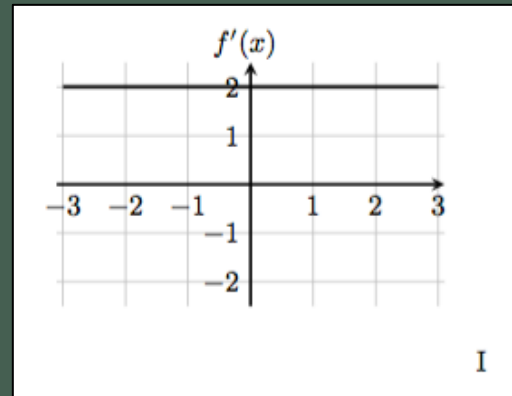
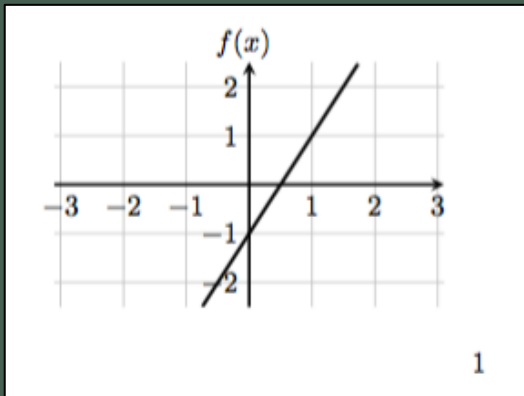
# Homework & Assessments

- Homework collected and graded for completion *DAILY*
- Take-home quizzes given *WEEKLY*
- Two-part tests (in-class & take-home) given every three weeks
- Tests were significantly **HARDER** than before IBL

# IBL part of the assessment

- Students graded on participation in class, with points awarded for level of work within the small group activities
- Student presentations required, with points awarded for work presented to the entire class

# Sample Classroom Activity

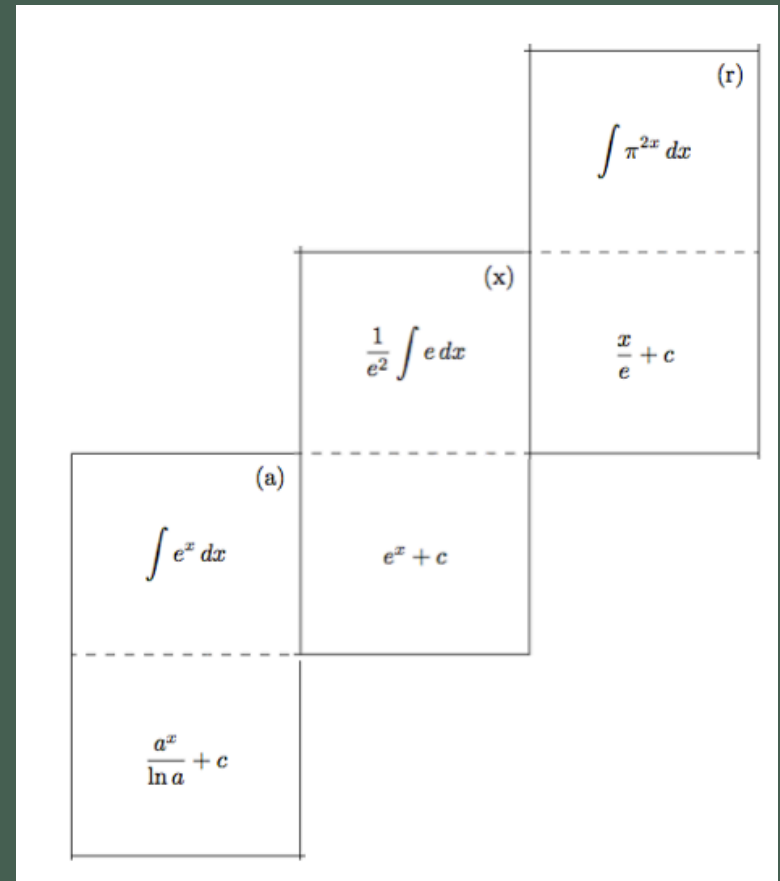


$f'(x) > 0$  and  $f''(x) = 0$  everywhere.

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# Integral Dominoes!

- Matching integrals to their antiderivatives
- Self-checking



# Developing a classroom culture

- Homework room was held daily – students worked together on assignments
- Instructor met with groups of students to provide suggestions – not answers!
- Group work on take-home quizzes

# Success with IBL calculus

- UNL's engineering department now requests a full section be saved for their first year students
- Pass rates are higher in IBL sections than any other sections
- Many IBL calculus students have now graduated with math degrees
- Classroom attendance was VERY HIGH – students knew if they were absent, they would miss out! There was good reason to come to class!
- IBL calculus changed the face of the mathematics education majors at UNO – diversified, increased quantity, increased quality
- Full notes have been written for group work style IBL calculus (I and II)

# Questions

- How do you cover all of the material in an IBL calculus class?
- Your turn...

# Thank you!

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