Name: Bennett Rennier

Course Hrs: M-F 10:30-12:45 Eastern

Office Hrs: M-F 1:30-2:30

Grading: 20% take-home midterm
30% oral final
25% online homework (WebAssign)
25% classwork

Course schedule on Collab under "Syllabus"

Game Plan

Zoom
- lectures and office Hours
- automatically recorded and uploaded to Collab
- can raise your hand or chat

WebAssign
- Online homeworks assigned everyday
- due next day at midnight
- First assignment due tomorrow
- First two weeks are free
- schedule on Collab
- Upgrading to the new to the new edition
  - sticking with the 9th edition

Diagnostic Quiz
- Wednesday
- You'll have classtime
- not graded
- please don't look things up

Classwork

- Mostly everday
- broken into groups (pairs?)
- upload the classwork by midnight the day after

Notes will be uploaded to Collab under "Resources"

Exams

- take-home midterm. Given 7/24, due 7/27
- oral final exam. Given 8/7, 8/8, 8/9,

Calculus Overview

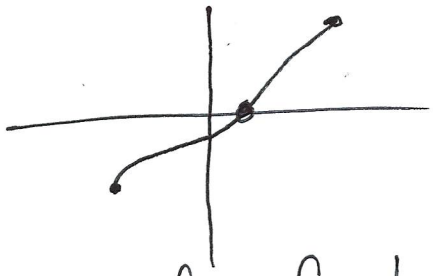
Week 1 - Review, Limits, Continuity, IVT

Review - algebra, geometry, functions

Limits - infinitely-good approximations

Continuity - functions with no jumps/holes

IVT - property of continuous functions



Week 2 - Differentiation

derivative is the rate of change of a function

$f(t)$ = position at time t

then the derivative of f is velocity

- derivative rules, geometric interpretations, intuition

Week 3 - Exponentials / Logarithms

- Using the derivative to solve problems

Week 4 - Integration

- the opposite of a derivative
- integrals to find area under a curve, average value a function.

Algebra Review

Arithmetic operations:

-1 operator, +1 operator

Subtraction, Addition

$2 = 1+1$, $3 = 1+1+1$

$2+3 = (1+1)+(1+1+1)$

$= 1+1+1+1+1 = 5$

Division, Multiplication

$2 \cdot 3 = 3+3 = 6$

$= 2+2+2 =$

Roots, Logs > Exponentiation

$2^3 = 2 \cdot 2 \cdot 2 = 8$

$3^2 = 3 \cdot 3 = 9$

$\sqrt[3]{2^3} = 2$ $\log_2(2^3) = 3$

Exponents: $5^3 = 5 \cdot 5 \cdot 5$

$5^2 \cdot 5^3 = (5 \cdot 5) \cdot (5 \cdot 5 \cdot 5) = 5^5$ $x^a \cdot x^b = x^{a+b}$

$(5^2)^3 = 5^2 \cdot 5^2 \cdot 5^2 = 5^{2+2+2} = 5^6$ $(x^a)^b = x^{ab}$

$(5 \cdot 3)^2 = (5 \cdot 3) \cdot (5 \cdot 3) = 5^2 \cdot 3^2$ $(xy)^a = x^a y^a$

} Exponent rules

$\underbrace{5^0}_{1} \cdot 5^2 = 5^{0+2} = 5^2$

5^{-3}? $5^{-3} \cdot 5^3 = 5^{3-3} = 5^0 = 1$

$5^{-3} = \frac{1}{5^3}$ $(5^2)^{1/2} = 5^{2 \cdot \frac{1}{2}} = 5$

Additional rules: $x^0 = 1$

$x^{-a} = \frac{1}{x^a}$ $x^{1/2} = \sqrt{x}$

Galileo dropped things and tested their position

$-9.8x^2$ m

"Things fall at the rate of summing odd numbers."

$1 = 1$

$1+3 = 4 = 2^2$

$1+3+5 = 9 = 3^2$

$1+3+5+7 = 16 = 4^2$

Algebra: Polynomials

Examples) x^2+3x-7 $\times$

$5x^3 - \frac{1}{2}x$

Non-examples) $\sqrt{x}$, $x^{1/5}$, x^{-7}

Why are polynomials important?

- incredibly common
- quite simple
- they approximate any function

Solving Polynomials:

$x^2 - x - 42 = 0$

$(x-7)(x+6) = 0 \Rightarrow$ Either $x-7=0 \Rightarrow x=7$

$x+6=0 \Rightarrow x=-6$

Quadratic equation:

$x^2 - x - 6$ $\quad ax^2+bx+c$, the roots are $\frac{-b \pm \sqrt{b^2-4ac}}{2a}$

More than 80% of the time, you can factor by guessing

Worksheets

- Always on WebAssign under Assignments
- Print them before or write on your own paper
- "Due date" - that day at midnight, "Acceptance date" but I'll accept until the next day
- Solutions ~~posted~~ Uploaded under Resources

Tomorrow - geometry and functions
- Worksheet 1
- WebAssign HW1 due tomorrow at midnight