

## WELCOME TO MATH 223/224 INTRODUCTION TO CALCULUS/DIFFERENTIAL CALCULUS

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On the Math 223/224 Director's page you will find the syllabus with grade policy and distribution of points to tests and quizzes/take-home assignments and WebAssign. Also, several previous semester final exams (midway through, when 223 ends).

### **For WebAssign, our class key is binghamton 1995 8714**

The e-book for Stewart's Precalculus 7e is in several places. It is easiest to go to My Assignments, where you will find the e-book, broken down into Chapters and Sections.

Find Steps to get to Kazmierczak videos here.

Exercises in *Precalculus*, Stewart, 7th ed. are to do addition to the WebAssign. They won't be collected, but you should have questions to ask in class.

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### WEEK 1 AUG 24-27

Summary of assignments for first week—if any exercises give you trouble, rest assured we'll cover them in class. Early exercises give me a broad idea of how familiar you are with fundamentals.

EXERCISES ARE NOT HANDED IN, EXCEPT WHEN ASSIGNED AS 'TAKE-HOME'.

- Read textbook (e-book) Sections 1.8, 1.10, 1.9 and watch Kazmierczak Videos embedded there (also found in Resources)
- Do Exercises Sec 1.8 #16, 18, 22, 32, 38, 47, 52, 60, 65, 79, 80, 88, 97, 99, 102, 113, 119, 120, 122
- Do Exercises Sec 1.10: #4, 5, 6, 12, 13, 16, 17, 20, 23, 26, 29, 34, 35, 37, 39, 40, 45, 48, 50, 58, 62, 64, 66, 67, 72, 73, 77, 88, 90
- WebAssign: Appendix A and Appendix B (skip Warm Up Appendix C). Don't wait till the night before the due date to start these! I won't answer questions on email the night before.

### WEEK 2 Aug 30-Sept 3

Adding videos for solving inequalities of all kinds: Video 1 Video 2 Video 3 Video 4 Video 5

**By Monday Aug 30** be acquainted with WebAssign. Ask in class if you are still unsure.

- WebAssign:
  1. By Tuesday, Appendix A and Warm-up Appendix C
  2. By Wednesday, Appendix B and Warm-up Sec 1.1
  3. By Friday, Appendix C and Warm-up Sec 1.2
- Read textbook Sections 1.4, 2.2, 2.3, 2.6 and watch the Kazmierczak Videos embedded there
- By Friday Sept 3, do *selected* Exercises for Sections 1.9, 1.4, 2.2, 2.3, 2.6 (to be posted soon)

**Saturday Sept 4** installment:

- WebAssign: Extensions granted to Sept 6 or 7. Get to it!
- Friday's remote lecture

## WEEK 3 SEPT 6-10

- Read e-book Sec 2.6 and 2.7 and view Kazmierczak videos embedded there

The videos can also be found under 'Resources' on your WebAssign homepage. See the screenshots here: Steps to get to Kazmierczak videos

- Do textbook exercises - see answers (all are odd) and have questions for me on Friday.

Sec 1.9: #13, 17, 19, 27, 31, 37, 45, 47, 55, 67, 71, 75

Sec 1.4: #9, 11, 19, 23, 29, 33, 37, 41, 45, 63, 79, 85

Sec 2.2: #1, 5, 7, 9, 17, 23, 27, 31, 39, 43, 47, 53, 59, 63, 69, 79

🤪 I DO NOT COLLECT EXERCISES, UNLESS I TELL YOU AHEAD OF TIME.

- 😊 Due to all the homework and WebAssign, *no take-home*
- 🤪 QUIZ 1 IS FRIDAY SEPT 10

Quiz covers absolute value and quadratic inequalities, eqns of a line (both point-slope and slope-intercept forms), circle (complete the square to identify center and radius, be able to graph it and find intercepts)

- Read textbook Secs 1.5, 3.1, 3.2 and view Kazmierczak videos for same, which I accidentally omitted in the above reading - I apologize

Here is Another tour of this site and WebAssign/ebook/resources

## Weekend Sept 10-12

- Read Secs 3.3 and 3.4 and view Kazmierczak and Mosely videos Sec 3.3 and Kazmierczak videos in Sec 3.4
- WebAssign Warm up Sec 1.3
- Textbook exercises in Sec. 2.6 (These are very short!):

#3, 5, 9, 11, 15, 19, 24, 25, 27, 28, 43, 47, 51, 59, 63, 65, 69, 83-90

## WEEK 4 SEPT 13-17 🤪 TRIGONOMETRY STARTS ON WEDNESDAY

**Mon Sept 13-Tues Sept 14**

- Do textbook exercises:

Sec. 2.7 #29, 31, 33, 51, 55, 63

Sec 3.1 #3, 4, 7, 13, 23, 29, 39

Sec 3.2 #3, 9b-13b (skip the part a), 19, 37

Sec 3.3 #1, 2, 5, 11, 31

- Read Sec 6.1, 6.2, 6.3 and view Kazmierczak videos therein
- WebAssign:

1. By Tues morning, Warm up Sec 1.3 (extension granted)
2. By Tues night, Sec 1.3 part 1 graphing transformations
3. By Tues night Class Warm up Dividing polynomials and factoring

### **Wed Sept 15-Thurs Sept 16**

- Keep reading Sec 6.1, 6.2, 6.3 and view Kazmierczak videos therein
- WebAssign:

1. Let me know *before 7 pm* if you need an extension on a WA
2. By Wed night, Sec 1.3 part 1 (extended) and part 2
3. By Fri morning App D warm up

- To hand in Monday 😊 (you're welcome): TAKE HOME #!Take home #1
- 🧐 Study for Friday's Quiz #2: Sec 2.6 Transforming functions, Sec 2.7 Composition of functions and domain, Sec 3.2 Graphing polynomials (end behavior, y-intercept, roots/multiplicity), Sec 3.3 Equivalent statements about polynomial roots and factors
- Draw two nice circles like I did in class: one with the multiples of  $\pi/4$ , the other being multiples of  $\pi/6$ . Be sure to include the degree equivalents. Keep these circle diagrams handy, on your desk, to refer to as we dive into trigonometry. (You may use on the next Friday quiz.)

👉 I didn't mean to include the App D for tonight! We aren't there yet. I took it off ~

### **MIDTERM IS SEPT 27 AND FINAL IS OCT 18**

See WEEK 5 for weekend homework.

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### WEEK 5

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### **Saturday Sept 18 and Sunday Sept 19** *Weekend trigonometry videos*

FOR MONDAY, WATCH THESE! YOU WILL BE GLAD YOU DID 😊

Here are 30 minutes of videos taking us from understanding where the points on the unit circle come from to graphing the sine and cosine *functions* from these points.

We named the x and y coordinates by looking at the special angles 0,  $\pi/6$ ,  $\pi/4$ ,  $\pi/3$  and  $\pi/2$ . Here, Professor Norm Prokup does it with a bit of simple geometry (Pythagorean theorem), which will prepare you well for calculus - which after all relies on analytic geometry! Learn and enjoy ~

Trig 1, Trig 2, Trig 3, and Trig 4

Trig 5, Trig 6, Trig 7, and Trig 8

Don't forget to complete TAKE HOME #1

Catch up on WebAssign and textbook exercises. I will add a trig batch on Monday.

Check it out

**Mon Sept 20-Tues Sept 21** Don't forget the midterm is a week from today, Monday. Here are a couple of items I promised today. They should help.

- Here's the Nutley High School Trig Eqn Worksheet and Solutions to Nutley High School Trig Eqn Worksheet
- View Domain of a composition of functions Ex 1 and Ex 2, which entails a nice review of solving a rational inequality! Also, here is a Rule and example of finding domain of  $(f \circ g)(x)$
- App D in WebAssign is due Sept 21 at night, the Midterm Review is due Sept 26, but I see it's not graded. DO IT ANYWAY to get ready for the Midterm. We can look at it in class assuming I have a working tablet by then
- Readings in textbook: Sections 2.8, 5.5 and 6.4 (Inverse trig functions go on the next exam, but reading about them can help you see the solutions to the trig equations)

### **Wed Sept 22-Sunday Sept 23**

- Continue working on the Nutley High School worksheets and have questions ready for me

### **Weekend study for Monday's Midterm**

- Do the WebAssign Midterm Review if you have not yet completed it
  - STUDY Dr Kazmierczak's Spring 2015 Math 223 midterm and Solutions 🤓
  - Extra practice
1. Transforming functions Sec 2.6: #7-51 odd (you did many of these in a previous assignment)
  2. Dividing Polynomials Sec 3.3: #5, 13, 17, 23, 27, 39, 57, 63
  3. Real Zeros of Polynomials: Sec 3.4, 31, 5, 9, 11, 17, 31, 55, 61
  4. Unit Circle: Sec 5.1: In #3, 5, 7 ask we show that certain points are on the unit circle. They are not the special angles of your unit circle. Yet all you have to do is show  $x^2 + y^2 = 1$  and you did it. This is the Pythagorean identity. Also, #9, 11, 13, 23-37 odd
  5. Nutley High School Trig Eqn Worksheet #1-6

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WEEK 6

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### **Wed Sept 29-Thurs Sept 30**

You can start using the Stewart *Calculus* e-book on your Cengage site now. It's in the same box as the *Precalculus*

book. I could have been using the calculus book's section numbers from the start, but I honestly did not understand the schema. The only one that wasn't replicated in the precalculus was the App D. Which I taught with videos and my notes. So...

- Read App D in Stewart *Calculus* and if you would like to take another crack at the WebAssign for App D, I rescheduled it to Friday morning.
- Read Stewart *Calculus* Secs. 6.1 and 6.6 on inverse functions and inverse trig functions and videos therein
- Read Stewart *Calculus* Sec 6.2 exponential functions and videos therein
- 🤪 Looking ahead, but not by much: The next WebAssigns start coming due Monday Oct 8. *Begin them now, after doing the corresponding reading and video.* You likely know a lot of the concepts already. If you have a question, send it to me within the WA communication! Here's a summary of the WA schedule:

Oct 4 before class: CLASS WARMUP: Sec 6.2

Oct 4 end of day: Secs 6.1 & 6.6

Oct 6 before class: CLASS WARMUP: Sec 6.3

Oct 8 before class: CLASS WARMUP: Sec 1.5

Oct 8 before class: CLASS WARMUP Sec 1.6

Oct 8 end of day: Secs 6.2 and 6.3

🤪 Friday Panopto recording

### **Friday Oct 1-Sun Oct 3**

See the WebAssign that are due early in week and get those going, don't wait till you are late

Read Stewart *Calculus* Secs 6.2 and 6.3

View all Kazmierczak videos in text Secs 4.1-4.6

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## WEEK 7

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### **Mon Oct 4-Tues Oct 5**

Do WebAssign CLASS WARMUP: Sec 6.3 before class on Wednesday

View the super short Where e comes from

Read *Calculus* e-book Sec 1.5 Limit of a Function (intuitive) and view the Kazmierczak and Mosely videos in *Precalculus* e-book Sec 13.1

Read *Calculus* e-book Sec 1.6 Calculating Limits Kazmierczak and Mosely videos in precalc text Sec 13.2

You can do WebAssign before they are due for most of the ones listed in last week's summary

**Wed Oct 6-Thurs Oct 7**

Here are the limit videos the Math 220s watch; you will find them helpful:

Finding limits from a graph (little rough quality, but good)

Evaluate limits using properties, Ex 1

Evaluate limits using properties, Ex 2

More techniques for evaluating limits, Ex 3

😄 Optional, good insight, might actually help you better understand the actual limits we have done:

Precise definition of limit

😄 Practice for mini-quiz and rest of course 😊

I will add more problems to this for the skills test, which will be next Wednesday!

**Fri Oct 8-Sun Oct 10**

More of the Math 220 videos:

More techniques for evaluating limits, Ex 3

Ex 4 involving radicals

Ex 5 also with radicals

😄 IMPORTANT Infinite limits in which a function goes to positive infinity or negative infinity as  $x$  approaches  $a$ :

Ex 6 involving rational expressions

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WEEK 8

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**Mon Oct 11-Wed Oct 12**

*Change in plans* - There is no skills test, due to a lack of time to thoroughly cover the rest of limits and review for Monday's final. I didn't figure Fall Break into my calendar.

😄 Do the following Stewart *Calculus* Exercises and *have questions for any and all sections ready to ask in class* 😄

Sec 1.6, Exercises #1, 10, 15, 17, 19, 23, 25, 29, 31, 33, 45, 51, 54\*

Sec 1.8 Exercises #3, 7-27 odd, 39-48 all

Did you watch Kazmierczak and Mosely videos for Sec 13.1 and 13.2 in Stewart *Precalculus*?

Here are the mini-videos I post for Math 220 on continuity:

Graph a piecewise fcn 1

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Graph a piecewise fcn 2

Continuity and limits made easy

Discontinuities in a function (piecewise)

More inspecting for discontinuities of a piecewise function

**Thurs Oct 14-Sun Oct 17** 😊 Study well for the Math 223 final

Soon I will post a brief review video. Topics to study (see problems in Stewart and WA) are those since the midterm:

- Unit circle values as always must be known to do anything involving trig fcns
- Inverse functions: determining the inverse of a given one-to-one fcn; evaluating inverse trigonometric fcns
- Logs and exponentials: evaluating or simplifying via log definition and log and exponential properties; finding domains, solving equations, graphing transformations in detail (intercepts, asymptotes, accurate shapes)
- Limits and continuity: evaluating limits of all kinds; understanding continuity and finding points of discontinuity

I notice that WA does not have Sec 1.8 practice. So definitely do the problems I assigned.

Here are the two previous exams and solutions, posted by Dr Kazmierczak on the main website.

Fall 2015 final exam and Fall 2015 final exam solns

Fall 2016 final exam and Fall 2016 final exam solutions

⚠️ THESE ARE *NOT* SUFFICIENT PRACTICE!! REVIEW WEBASSIGN AS WELL AS STEWART HOMEWORK TO BE PREPARED ⚠️

😊 Review sessions: Part 1, Part 2, and Part 3

From:

<http://www2.math.binghamton.edu/> - **Binghamton University Department of Mathematical Sciences**

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