Math 105: Preparation for College Mathematics

Spring 2015

instructor: landon rabern
email: lrabern@fandm.edu

class webpage: bit.ly/precalculus2015
class meetings: 8:00 AM–8:50 AM MWF in STA 215 (lecture / group work)
8:00 AM–8:50 AM R in STA 215 (working problems)
office hours: 10:00 AM–10:50 AM MWF in STA 108
textbook: *Pre-Calculus, 6E*, by Stewart, Redlin, and Watson

What is this class about?

We will look at functions and how to play with them safely. Our investigations will include polynomial, rational, exponential, logarithmic and trigonometric functions. We'll encounter numbers with attributes such as being "irrational", "transcendental", and even "imaginary". By the end of the course you'll be able to bisect an angle using only a compass and straightedge just like the ancient Greeks. Unlike the ancient Greeks, you will also know why you can't trisect an angle in such a manner.

Homework

> I can only show you the door. You're the one that has to walk through it.
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To achieve fluency in this subject, you will need to immerse yourself in the material. Working tons of problems is a great way to do this. How many problems? My recommendation would be to work problems of a given type until they become easy for you.

I will put a list of practice problems for each class period on the class webpage. These will not be collected. Each Friday, I will select a couple of the more interesting problems and assign them—due the following Friday. These will be graded both for correctness and clarity of exposition.

Quizzes

Pop quiz, hotshot.

There will be tiny quizzes at random times throughout the course. I will set the random number generator so that the expected number of quizzes is 10. Quizzes are intended to reinforce basic concepts as well as encourage attendance. Unlike exams, quizzes will be closed-book. Your lowest three quiz scores will be dropped.

Exams

There will be two in-class exams and then a final exam during finals week. The purpose of the exams is to test your understanding of, and ability to reason about, the mathematical concepts. Since you can use your textbook as well as any other written material, no memorization is required; however, these exams occur in a finite time period, so rapid recall of facts will serve you well. All electronic devices should be stowed in your bag for the duration of the exam and any brain implants should be turned off.

Graded work breakdown

what	%	when
homework	20	weekly
quizzes	10	random times
in-class exam #1	15	Friday, February 13$^{\text{th}}$
in-class exam #2	25	Friday, March 13$^{\text{th}}$
final exam	30	TBA, in finals week

Help

If you need help or just want to know more about something, please come to my scheduled office hours or set up another time to meet. In addition to my office hours, there are several undergraduate mathematics teaching assistants who hold regular hours.

Attendance

Please be advised that Math Department and F&M policy state that penalties (including grade reduction and/or dismissal from the course) may be assessed for excessive, unexcused absences.

Tentative Schedule

Monday	Wednesday	Friday
Jan 12th	14th **1** 1.1 real numbers	16th **2** 1.2, 1.3 exponents, algebraic expressions
19th Martin Luther King Day	21st **3** 1.4, 1.5 rational expressions, equations	23rd **4** 1.7 inequalities
26th **5** 1.10 lines	28th **6** 2.1, 2.2 functions and their graphs	30th **7** 2.3 what we can learn from the graph
Feb 2nd **8** 2.5 transformations of funtions	4th **9** 2.6 composition of functions	6th **10** 2.7 one-to-one functions and inverses
9th **11** exam #1 review	11th **12** exam #1 review	13th **13** **in-class exam #1**
16th **14** 3.1 quadratic functions	18th **15** 3.2 polynomial functions	20th **16** 3.3 long division
23rd **17** 3.4 zeroes of polynomials	25th **18** 3.5 imaginary numbers	27th **19** 3.6 the fundamental theorem of algebra
Mar 2nd **20** solving cubics and quartics by radicals, Galois theory	4th **21** 3.7 rational functions	6th **22** Lagrange interpolation and IQ tests
9th **23** exam #2 review	11th **24** exam #2 review	13th **25** **in-class exam #2**
16th Spring Break	18th Spring Break	20th Spring Break
23rd **26** 4.1, 4.2 exponential functions	25th **27** 4.3, 4.4 logarithms	27th **28** 5.1 the unit circle
30th **29** 5.2 trigonometric functions	Apr 1st **30** 5.3 trigonometric graphs	3rd **31** 5.5 inverse trigonometric functions

Monday	Wednesday	Friday
6th **32** compass-and-straightedge constructions	8th **33** compass-and-straightedge constructions	10th **34** attempt to trisect an angle
13th **35** 7.1 trigonometric identities	15th **36** 7.2, 7.3 more identities	17th **37** why we didn't succeed in trisecting the angle
20th **38** final exam review	22nd **39** final exam review	24th Reading Day
27th Reading Day	29th Finals week	May 1st Finals week