Core Curriculum Assessment Report
For
Core Classes
In the
Department of Mathematics and Statistics
June 2013

Committee Members

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I. Introduction

The Department of Mathematics and Statistics (DMS) has completed its review of the core mathematics courses for 2013. DMS has formed the core committee to assess the core mathematics courses offered in the last six semesters. The committee met in May 2013 to gather the data in this report. DMS currently offers nine core courses, of which four were reviewed by the committee. The Statistics faculty have decided to come together to assess STAT 200x and will submit a separate report for this course. Due to the number of course selections and the size of the committee it was not possible to assess more courses at this time.

The core mathematics curriculum was designed in order that students will achieve "advanced literacy in mathematics." The description of the Core Curriculum as in The UAF Baccalaureate Experience: The Philosophy asserts that "advanced literacy in mathematics implies a solid grasp of quantitative reasoning and appreciation of mathematical applications. Most important is acquiring the knowledge necessary for informed judgment on the uses of mathematical and statistical interpretations confronting us in everyday life." Our assessment of the core mathematics courses will address this goal. Each core class is unique and will address mathematical literacy in a unique way.

II. Methodology

The way in which the courses are assessed is based on the philosophy of the core, the Core Curriculum Review Process for the Core Classes in mathematical sciences, and the assessment report on the courses completed in 2011. In 2011, Math 107, 200, 262, and 272 were assessed. This assessment will review Math 103, 161, 201 and 202. Below is a table displaying all the core math courses and when they were assessed.

Core Courses

Year	103	107	161	200	201	202	262	272
2003	x	x		x	x	x	x	x
2005		x	x				x	x
2007	x	x	x	x	x	x		
2009	x		x		x	x	x	x
2011		x		x			x	x
2013	x		x		x	x		

Final exams for these courses were sampled from summer of 2011 to spring of 2013. For each set of exams, problems were chosen that represent each outcome. The student learning outcomes for the math courses are

- Students are able to master problem solving skills
- Students learn to manipulate abstract symbols

- Students learn a broad spectrum of mathematical applications

The third outcome, the related objectives are unique to each individual course. Thus, the outcome is split into several different concepts for each course.

The committee reviewed each of the exams for the learning outcomes. Looking at each student's response, the committee gave the response a rating from 4 to 0, 4 being the highest indicating that the student showed a high level of competence in understanding, while zero being the lowest indicated no understanding of the material or that the student did not respond to the question. In addition committee members made comments about the exams and the grading on the exams.

III. Discussion of Specific Courses

A. Math 103x - Concepts and Contemporary Applications of Mathematics

Math 103 is designed to be a final math course for students majoring in a liberal arts field. This course contains applications and concepts applicable to many fields as they relate to mathematics. As a core course, it is expected that the enrollment will include most majors in liberal arts, fine arts, and other disciplines where analytical skills such as Calculus have not traditionally played an important part. With emphasis on management science, data management, social choice, decision-making, and statistics, the topics covered in math 103 are good representations of the logical and computational needs of a modern college graduate.

It is not in the aim of the Department of Mathematics and Statistics to create a rigidly standardized syllabus, as Math 103 is viewed as a terminal mathematics course. Our current textbook contains more material that can be discussed in one semester and therefore the instructors retain some flexibility in choosing topics to cover. Presently, the syllabus consists of nine mandatory chapters and a choice of one or two optional chapters. For the third outcome, Math 103 splits this into the following objectives:

- Basic statistics
- Graph theory and its applications
- Probability
- Social choice and voting systems

While performing the assessment of math 103, the committee had a major concern.
Currently only 9% of the math 103 students are taught by full-time DMS faculty, and more than 40% of the students in this course are taught by faculty outside of DMS. This created some concern as to whether the department should have oversight of this course during the semester. In the six semesters, there were 30 sections of math 103 offered on the main campus, in our branch campuses, and through distance education. Of the 30 sections, we received exams from 12 of those sections. It should be mentioned that we did not receive exams from any of the CTC sections, very few of the distance sections, and one of the DMS sections. Of the exams assessed, the committee found that probability seemed to be the most difficult topic for the students.

	Math 103	Scores					# of exams	average	average %	% at
	Outcome	4	3	2	1	0	assessed	out of 4	score	3 or 4
1	Problem solving skills	17	13	30	21	14	95	2.0	49	32
2	Manipulate abstract symbols	30	17	17	13	18	95	2.3	57	49
3a	Basic Statistics	26	30	20	9	10	95	2.6	64	59
3b	Graph theory & applications	34	16	17	8	20	95	2.4	59	53
3c	Probability	25	8	14	20	28	95	1.8	45	35
3d	Social choice and Voting	38	13	17	16	11	95	2.5	63	54

B. Math 107x-Functions for Calculus

Math 107 is a course designed to prepare students for the trig-based calculus sequence. This course is a prerequisite course for Stat 200, Math 205 and 206, core science courses, some engineering and computer science courses. Though this course is used as a terminal course for some, it was not designed that way. It covers a wide range of topics, such as algebra, operations on functions, graphing, logarithmic and exponential functions, sequences and series, systems of equations, and some conic sections. Due to the large number of topics in this course, the syllabus is fairly rigid. The rigor designed in this course and the inflexibility of the syllabus, is our way to ensure that this course meets the spirit of the core.

In recent semesters, prerequisite testing and common final exams have been put into place for this course, to ensure that students are entering with the correct prerequisite knowledge and completing the course with sufficient knowledge and rigor as needed for Calculus I. Though this course was not assessed in this cycle, we would like to review some of the information gathered before the next assessment period.

C. Math 161x-Algebra for Business and Economics

The main goal of this course is to prepare students to take Calculus for Business and Economics. This course is also used as a terminal course for some students in the liberal arts. Because this is a pre-calculus course, it covers a range of topics, such as algebra, graphing, exponential and logarithmic functions, mathematics of finance, and some linear algebra. Due to the large number of topics in this course, the syllabus fairly rigid. The rigor designed in this course, and the inflexibility of the syllabus, is our way to ensure that this course meets the spirit of the core. For the third outcome, math 161 is split into five sub-outcomes. In addition to the three previously mentioned outcomes, a fourth criterion was added for math 161. This criterion is that students have mastered the prerequisite material for the course. While this outcome does not directly address student outcomes for the course, it does address the problem of incorrect student placement, which has been partially addressed by mandatory placement.

Currently 16% of math 161 students are taught by full-time DMS faculty, and more than 40% of the students are taught by faculty outside of DMS. Like math 103, there is some concern as to whether DMS should have oversight of this course during the semester. In the six semesters, there were 22 sections of math 161 offered on campus on the main campus, in our branch campuses and through distance education. Of the 22 sections, we did not receive exams from nine of them. Many of the ones that we did not receive were from distance sections. Some things that were noticed while assessing exams:

- Some of the exams did not have any word type problems or applications that required students should do some sort of problem solving
- One of the criteria that is assessed as solving equations, and the committee found that many of the equation students were asked to solve were not at the rigor intended for this course

- In terms of grading of the exams we found one of the instructors did not require proper function notation, some of the graded exams were graded incorrectly, some instructors gave points regardless of what was written down
- None of the exams assessed the objective of manipulating abstract symbols
- There does not seem to be consistency among the exams, in that some exams require calculators, some allow calculators but are not required, some allowed no cards, and some instructors allowed answers without work being shown
- For the graphing of functions many used only basic functions like a quadratic and linear, there did not seem to be enough rigor (no exponentials or logarithms, no rationals, no polynomials, etc.)

Math 161

	Outcome	Scores 4	3	2	1	0	# of exams assessed	average out of 4	average % score	% at 3 or 4
1	Problem solving skills	2	13	20	6	23	64	1.5	36	23
2	Manipulate abstract symbols	0	0	0	0	0	0	0.0	0	0
3a	Nature of Functions	22	35	35	30	15	137	2.1	53	42
3b	Solving Equations	16	30	38	40	13	137	2.0	49	34
3c	Graphing Basic Functions	20	11	19	8	16	74	2.1	54	42
3d	Exponentials & Logarithms	14	32	42	29	20	137	1.9	48	34
3e	Applications of exp & logs	20	3	4	7	1	35	3.0	74	66
3f	Math of Finance	33	29	24	26	11	123	2.4	60	50
4	Prerequisites	15	14	19	34	3	85	2.0	51	34
						Averages	88.0	1.9	47.2	36.1

For this course, we also broke this down by campus courses versus non-campus or distance courses.

Math 161

Campus

	Outcome	Scores 4	3	2	1	0	# of exams assessed	average out of 4	average % score	% at 3 or 4
1	Problem solving skills	2	13	20	6	21	62	1.5	38	24
2	Manipulate abstract symbols	0	0	0	0	0	0	0.0	0	0
3a	Nature of Functions	18	28	24	20	10	100	2.2	56	46
3b	Solving Equations	6	26	30	30	8	100	1.9	48	32
3c	Graphing Basic Functions	20	11	17	8	16	72	2.2	54	43
3d	Exponentials & Logarithms	10	30	30	22	8	100	2.1	53	40
3e	Applications of exp & logs	0	0	0	0	0	0	0.0	0	0
3f	Math of Finance	30	23	13	16	4	86	2.7	67	62
4	Prerequisites	15	14	19	34	3	85	2.0	51	34
						Averages	67.2	1.6	40.8	31.2

Math 161

CTC / CDE

	Outcome	Scores 4	3	2	1	0	# of exams assessed	average out of 4	average % score	% at 3 or 4
1	Problem solving skills	0	0	0	0	2	2	0.0	0	0
2	Manipulate abstract symbols	0	0	0	0	0	0	0.0	0	0
3a	Nature of Functions	4	7	11	10	5	37	1.9	47	30
3b	Solving Equations	10	4	8	10	5	37	2.1	53	38
3c	Graphing Basic Functions	0	0	2	0	0	2	2.0	50	0
3d	Exponentials & Logarithms	4	2	12	7	12	37	1.4	36	16
3e	Applications of exp & logs	20	3	4	7	1	35	3.0	74	66
3f	Math of Finance	3	6	11	10	7	37	1.7	42	24
4	Prerequisites	0	0	0	0	0	0	0.0	0	0
						Averages	20.8	1.3	33.6	19.3

D. Math 200x – Calculus I

Math 200 is the first course in a three-semester calculus sequence. Students taking this course are usually majors in physical sciences, engineering, or other mathematical sciences. This course covers differential calculus and introduces integral calculus, and thus has a fairly rigid syllabus. Recently, faculty within the department have started offering common final exams, to ensure that all students in Calculus I are assessed uniformly.

In addition to the first two outcomes, the third outcome was split into the following objectives specific to Math 200.

- Limits and continuity
- Differentiation and integration
- Maximization/minimization problems
- Analysis of functions of one variable and their graphs
- Applications of integrals and derivatives

Due to previously stated reasons, we did not include Math 200 in this Assessment Report.

E. Math 201x - Calculus II

Math 201 is the second course in a three-semester calculus sequence. Students taking this course are usually majors in the physical sciences, engineering, or other mathematical sciences. This course covers integral calculus, sequences and series, and thus has a fairly rigid syllabus. Recently, faculty within the department have started offering common final exams, to ensure that all students in Calculus II are assessed uniformly.

In addition to the first two outcomes, the third outcome is split into the following objectives specific to Math 201.

- Integration techniques
- Analysis of functions and graphs
- Applications of differentiation and integration
- Sequences and series

While performing assessment of Math 201, the committee made the following observations. In the last six semesters, there were 25 sections of Math 201, of which we received exams for 19 sections. We only received exams for 1 of the 5 sections taught during the summer (this is campus and distance). Some other observations that were made during the assessment are as follows:

- Full time DMS faculty taught only 32% of the sections offered.
- The numbers obtained are pretty arbitrary since problems of a particular type varies substantially in difficulty.
- There seemed to be some consistency in what was offered for the functions and graphs throughout the exams, however, the integration problems varied drastically. Some exams required integration by parts and trigonometric substitutions to evaluate integrals (which is what we should expect for a Calculus II final) while others had some that could be done with basic u-substitution.
- Some of the final exams were graded incorrectly and for some instructors the grading did not seem consistent.

Math 201

	Outcome	Scores 4	3	2	1	0	# of exams assessed	average out of 4	average % score	% at 3 or 4
1	Problem solving skills	35	28	25	29	3	120	2.5	63	53
2	Manipulate abstract symbols	25	49	53	46	7	180	2.2	55	41
3a	Integration techniques	27	67	52	29	5	180	2.5	61	52
3b	Analysis of functions & graphs	47	61	26	37	9	180	2.6	64	60
3c	Apps of differentiation/integration	41	56	38	34	11	180	2.5	61	54
3d	Sequences and series	27	50	50	46	7	180	2.2	56	43
						Averages	170.0	2.4	60.0	50.5

F. Math 202x - Calculus III

Math 202 is the third course in a three-semester calculus sequence. Students taking this course are usually majors in engineering or other mathematical sciences. This course covers multivariable calculus and thus has a fairly rigid syllabus.

In addition to the first two outcomes, the third outcome is split into the following objectives specific to Math 202.

- Optimization
- Analysis of functions
- Multiple integrals and partial fractions
- Applications of multiple integrals
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While performing assessment of Math 202, the committee made the following observations. In the last six semesters, there were 19 sections of Math 202 taught to a total of 434 enrolled students. The majority of the instructors submitted finals for assessment. There were a couple of exceptions. In fall 2011, there were two sections with two instructors and only one set of exams. The exams have no instructor name and as of this writing, there was not enough information to identify the section. Exams from CDE do not have on them the semester in which they were taken. There is no section information. There are at least five different sections of distance courses for which a student might be taking a final exam, however, it was difficult to determine which section the student was in. Some other observations that were made during the assessment are as follows:

- One instructor whose courses enrolled 45% of the total math 202 enrollment and who taught at least one 202 course every one of the six semesters of this review gave exactly the same final exam every single semester; it is noted that there were students who took this instructor's course more than once over this period.
- The numbers obtained are pretty arbitrary since problems of a particular type varies substantially in difficulty.

Math 202

	Outcome	Scores 4	3	2	1	0	# of exams assessed	average out of 4	average % score	% at 3 or 4
1	Problem solving skills	26	23	21	17	14	101	2.3	57	49
2	Manipulate abstract symbols	29	28	9	16	19	101	2.3	58	56
3a	Optimization	36	20	14	15	16	101	2.4	61	55
3b	Analysis of Functions	30	20	28	14	9	101	2.5	62	50
3c	Multiple Integral & Partial Fractions	47	16	7	6	25	101	2.5	63	62
3d	Applications of multiple Integrals	26	20	11	26	18	101	2.1	52	46
						Averages	101.0	2.4	58.8	53.0

G. Math 262x - Calculus for Business and Economics

Math 262 is a one-semester calculus course that covers differential calculus, integral calculus and multivariable calculus. This course is primarily for business and economics students, many of them are taking this as a final math course. Other students who take this course are often using this as a substitute for Calculus I. The syllabus for this course is fairly rigid, and individual instructors are required to adhere to the syllabus in an attempt to make sure the course meets the spirit of the core.

When reviewing final exams for this course, in addition to the first two outcomes, the third outcome was split into the following objectives specific to Math 262.

- Limits and continuity
- Differentiation and integration - calculations
- Maximization/minimization problems
- Analysis of functions of one variable and their graphs
- Applications of integration and differentiation
- Partial derivatives

Due to previously stated reasons, we did not review Math 262 for this Assessment Report.

H. Math 272x-Calculus for the Life Sciences

Math 272 is a one-semester calculus course for majors in life sciences, which covers differential and integral calculus. The syllabus for this course is fairly rigid, and individual instructors are required to adhere to the syllabus in an attempt to make sure that the course meets the spirit of the core.

When reviewing final exams for this course, in addition to the first two outcomes, the third outcome was split into the following objectives specific to Math 272.

- Limits and continuity
- Differentiation and integration – calculations
- Maximization/minimization problems
- Analysis of functions of one variable and their graphs
- Applications of integrals and derivatives
- Differentiation and integration – concepts
    - Knowing how derivatives and integrals are related to graphs
    - Having the ability to discern whether differentiation or integration is involved
    - Understanding how a derivative and an integral relates to the original function

Due to previously stated reasons, we did not review Math 272 for this Assessment Report.

IV Conclusions

After completing this assessment, the committee has determined that there are some things that need to be addressed. To begin, the process of collecting final exams has improved over the years. However, we are still at a point where we are not receiving all of the final exams. In addition to receiving final exams, we are finding that it is difficult to tell which exams have been received, because many exams do not have instructor names on them, section numbers on them, or even the year that they are given.

Another concern the committee has is the variability in the problems. For example, in Math 107 solving equations is considered an outcome that needs to be assessed. However some instructors feel that being able to solve a linear equation is good enough, while others require more rigor and assess students on exponential equations or logarithmic equations etc. As a committee, we see that there needs to be some sort of commonality between the finals in order to provide a good assessment.

Grading of exams seems to be an issue as well. In every course that we have assessed, there have been at least one or two groups of exams in which the instructor has graded the exams incorrectly. This is something that needs to be fixed.

Due to the number of courses we need to assess, there needs to be a better schedule for when assessment occurs. For some of the courses we've taken action to improve the outcome assessment. However because we are assessing courses every six semesters, and some subset of these courses during that assessment, we don't always see the improvement until much later than needed.

Some suggestions from the committee:

- **All sections of a particular class agree to XX common problems which are used for assessment.**
  Based on the outcomes for the course, encourage all instructors teaching that course to discuss one problem for each of the outcomes that are being assessed. All final exams will include these same problems, so that when assessing, all exams for that course will be assessing the same skills.
- **Assessment occurs in more frequent but smaller batches.**
  This will make the assessment process much less time-consuming, while allowing DMS to catch problems with courses, delivery methods, or instructors much more quickly. This will also allow the committee to have multiple reviewers for courses.
- **All courses should have multiple versions of tests and the final exam.**
  This suggestion is mainly for distance courses. Distance courses should have exams changed at least every year. Students retaking courses should not be retaking the same assessments. The suggestion is slightly for campus courses as well. Students who are retaking courses with the same instructor should not be receiving the same assessment.
- **DMS should review Math 103 and 161 and see if oversight should be within DMS.**
  Most of the offerings for these courses are offered by part-time faculty or faculty outside of DMS. If DMS would like to retain oversight, there should be more collaboration with DMS full-time faculty. The committee plans to meet later, to determine options to make this work.
- **DMS needs to look at Math 161 and consider revising this course, adjusting the outcomes of the course or re-evaluate the students who are taking the course.**
  Math 161 had an outcome average of 1.9 which is fairly low for a course that is prerequisite to another core final course. This can be viewed as students have less than 50% understanding of the core outcomes needed for the next course.
- **DMS needs to review that all syllabi are actually meeting the criteria intended by the core curriculum.**

Some of the final exams that were reviewed did not meet the assessment criteria, mostly because some of the topics are not covered or some of the topics are covered more heavily than others.

- **DMS needs a mechanism to ensure that all faculty teaching core courses know the assessment process and why it is important to incorporate certain types of problems on their final exams.** Some of the exams that we assessed this period did not have problems for some of the outcomes. This could be due to instructors not covering the material, long exams covering other outcomes not necessary for core assessment, or it could be that the instructor viewed the outcome differently than what's being assessed by the committee.
- **DMS needs to create a mechanism so that students are assessed uniformly.** Many of the finals that were reviewed this period had different materials that were allowed for the exams. Some students were allowed calculators or note cards, some were given formulas. This made evaluating student skills difficult.

Caution: Please be aware that each course was assessed by a different subset of the committee. This means that the averages that are shown are comparable to only numbers within that table. Average scores in one course should not be compared to average scores in another course.

Math 103

	Outcome	Scores 4	3	2	1	0	# of exams assessed	average out of 4	average % score	% at 3 or 4
1	Problem solving skills	17	13	30	21	14	95	2.0	49	32
2	Manipulate abstract symbols	30	17	17	13	18	95	2.3	57	49
3a	Basic Statistics	26	30	20	9	10	95	2.6	64	59
3b	Graph theory & applications	34	16	17	8	20	95	2.4	59	53
3c	Probability	25	8	14	20	28	95	1.8	45	35
3d	Social choice and Voting	38	13	17	16	11	95	2.5	63	54

Math 161

	Outcome	Scores 4	3	2	1	0	# of exams assessed	average out of 4	average % score	% at 3 or 4
1	Problem solving skills	2	13	20	6	23	64	1.5	36	23
2	Manipulate abstract symbols	0	0	0	0	0	0	0.0	0	0
3a	Nature of Functions	22	35	35	30	15	137	2.1	53	42
3b	Solving Equations	16	30	38	40	13	137	2.0	49	34
3c	Graphing Basic Functions	20	11	19	8	16	74	2.1	54	42
3d	Exponentials & Logarithms	14	32	42	29	20	137	1.9	48	34
3e	Applications of exp & logs	20	3	4	7	1	35	3.0	74	66
3f	Math of Finance	33	29	24	26	11	123	2.4	60	50
4	Prerequisites	15	14	19	34	3	85	2.0	51	34
						Averages	88.0	1.9	47.2	36.1

Math 201

	Outcome	Scores 4	3	2	1	0	# of exams assessed	average out of 4	average % score	% at 3 or 4
1	Problem solving skills	35	28	25	29	3	120	2.5	63	53
2	Manipulate abstract symbols	25	49	53	46	7	180	2.2	55	41
3a	Integration techniques	27	67	52	29	5	180	2.5	61	52
3b	Analysis of functions & graphs	47	61	26	37	9	180	2.6	64	60
3c	Apps of differentiation/integration	41	56	38	34	11	180	2.5	61	54
3d	Sequences and series	27	50	50	46	7	180	2.2	56	43
						Averages	170.0	2.4	60.0	50.5

Math 202

	Outcome	Scores 4	3	2	1	0	# of exams assessed	average out of 4	average % score	% at 3 or 4
1	Problem solving skills	26	23	21	17	14	101	2.3	57	49
2	Manipulate abstract symbols	29	28	9	16	19	101	2.3	58	56
3a	Optimization	36	20	14	15	16	101	2.4	61	55
3b	Analysis of Functions	30	20	28	14	9	101	2.5	62	50
3c	Multiple Integral & Partial Fractions	47	16	7	6	25	101	2.5	63	62
3d	Applications of multiple Integrals	26	20	11	26	18	101	2.1	52	46
						Averages	101.0	2.4	58.8	53.0

Outcome Averages

2013 Scores

	average out of 4	average % score
103	2.5	63
161	1.9	47
201	2.4	60
202	2.4	59

Comparison of last assessment vs 2011 Outcome Scores

ⓘ We must caution the reader not to infer too much from these comparisons since different committee members may have done the reviews in the different years.

	Math 107	2007		2011	
	Outcome	average % score	% at 3 or 4	average % score	% at 3 or 4
1	Problem solving skills	57	44	47	32
2	Manipulate abstract symbols	76	74	57	43
3a	Nature of functions	70	69	45	27
3a	Solving equations	67	61	57	44
3b	Graphing basic functions	56	44	46	26
3c	Exponents & logarithms	60	49	53	41
4	Prerequisites	71	64	56	47
		57.8	65	51.6	64
	2011 scores minus 2007 scores			-6.2	-1.5

	Math 200	2007		2011	
	Outcome	average % score	% at 3 or 4	average % score	% at 3 or 4
1	Problem solving skills	50	33	60	53
2	Manipulate abstract symbols	48	25	77	80
3a	Limits & continuity	64	56	76	76
3b	Differentiation /integration	73	68	78	77
3c	Maximization/Minimization	52	33	65	52
3d	Analysis of functions & their graphs	66	48	73	66
3e	Applications of integrals & derivatives	58	38	59	52
		58.5	43.2	69.7	65.3
	2011 scores minus 2007 scores			11.2	22.1

	Math 262	2009		2011	
	Outcome	average % score	% at 3 or 4	average % score	% at 3 or 4
1	Problem Solving	80	83	57	53
2	Manipulate Abstract Symbols	82	90	58	43
3a	Limits and Continuity	81	84	82	86
3b	Differentiation and Integration	84	83	59	48
3c	Max/Min problem	64	57	80	72
3d	Analyzing Functions	75	75	53	44
3e	Applications of Der. And Int.	83	87	67	59
3f	Partial Derivatives	73	77	69	63
		77.9	79.6	65.5	68.0
	2011 scores minus 2009 scores			-12.3	-11.6

	Math 272	2009		2011	
	Outcome	average % score	% at 3 or 4	average % score	% at 3 or 4
1	Problem Solving	71	67	63	54
2	Manipulate Abstract Symbols	65	72	88	92
3a	Limits and Continuity	67	67	98	100
3b	Differentiation and Integration	49	44	73	77
3c	Max/Min problem	50	44	77	85
3d	Analyzing Functions	61	61	85	85
3e	Applications of Der. And Int.	64	56	73	69
3f	Der/Int Concepts	69	0	79	77
		62.0	51.4	79.6	79.8
	2011 scores minus 2009 scores			17.6	28.4