Submit original with signatures + 1 copy + electronic copy to Faculty Senate (Box 7500).
See *http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/* for a
complete description of the rules governing curriculum & course changes.

TRIAL COURSE OR NEW COURSE PROPOSAL

SUBMITTED BY:

Department	DMS	College/School	CNSM
Prepared by	Jill Faudree	Phone	474-7385
Email Contact	jrfaudree@alaska.edu	Faculty Contact	Jill Faudree

1. ACTION DESIRED
        (CHECK ONE):   Trial Course [X]   New Course [ ]

2. COURSE IDENTIFICATION: Dept [MATH]   Course # [194X]   No. of Credits [4.0]

Justify upper/lower division status & number of credits:

> Upper/Lower Division: This course will combine the topics from two 100-level courses: Math 107 Functions for Calculus and Math 108 Trigonometry.
> Number of Credits: The course will have 4 hours of classroom instruction per week over the course of a standard length semester.

3. PROPOSED COURSE TITLE: Preparation for Calculus

4. To be CROSS LISTED?   [NO]   If yes, Dept: [ ]   Course # [ ]
        YES/NO
   NOTE: Cross-listing requires approval of both departments and deans involved. Add lines at end of form for additional required signatures.

5. To be STACKED?   [NO]   If yes, Dept. [ ]   Course # [ ]
        YES/NO

How will the two course levels differ from each other? How will each be taught at the appropriate level?:

Stacked course applications are reviewed by the (Undergraduate) Curricular Review Committee and by the Graduate Academic and Advising Committee. Creating two different syllabi—undergraduate and graduate versions—will help emphasize the different qualities of what are supposed to be two different courses. The committees will determine: 1) whether the two versions are sufficiently different (i.e. is there undergraduate and graduate level content being offered); 2) are undergraduates being overtaxed?; 3) are graduate students being undertaxed? In this context, the committees are looking out for the interests of the students taking the course. Typically, if either committee has qualms, they both do. More info online - see URL at top of this page.

6. FREQUENCY OF OFFERING:

> Spring, Summer, Fall (We would like to run Preparation for Calculus as a trial course for three consecutive semesters Spring 2014, Summer 2014, Fall 2014. Ultimately we would like to turn this course into a regular offering.)

Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) — or As Demand Warrants

7. SEMESTER & YEAR OF FIRST OFFERING
(AY2013-14 if approved by 3/1/2013; otherwise AY2014-15)

> Spring 2014

8. COURSE FORMAT:
NOTE: Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school's curriculum council. Furthermore, **any core course compressed to less than six weeks must be approved by the Core Review Committee.**

COURSE FORMAT:
(check all that apply)   [ ]1 [ ]2 [ ]3 [ ]4 [ ]5 [X] *6 weeks to full semester*

OTHER FORMAT
(specify)

Mode of delivery
(specify lecture,
field trips, labs,
etc)   lecture and lab

RECEIVED

SEP - 6 2013

Dean's Office
College of Natural Science & Mathematics

TOM GREEN
9/9/13 TLF

9. CONTACT HOURS PER WEEK: | 4.0 | LECTURE hours/weeks | 1.0 | LAB hours /week | | PRACTICUM hours /week

Note: # of credits are based on contact hours. 800 minutes of lecture=1 credit. 2400 minutes of lab in a science course=1 credit. 1600 minutes in non-science lab=1 credit. 2400-4800 minutes of practicum=1 credit. 2400-8000 minutes of internship=1 credit. This must match with the syllabus. See http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/guidelines-for-computing-/ for more information on number of credits.

OTHER HOURS (specify type)	

10. COMPLETE CATALOG DESCRIPTION including dept., number, title, credits, credit distribution, cross-listings and/or stacking (50 words or less if possible):

Example of a complete description:

FISH F487 W, O   Fisheries Management
    3 Credits   Offered Spring
    Theory and practice of fisheries management, with an emphasis on strategies utilized for the management of freshwater and marine fisheries. *Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; ENGL F414; FISH F425; or permission of instructor.* Cross-listed with NRM F487. (3+0)

> MATH F194X Preparation for Calculus
> 4 Credits
> Various classes of functions and their graphs are explored numerically, algebraically and graphically. Function classes include polynomial, rational, exponential, logarithmic and trigonometric. Skills and concepts needed for Calculus I (MATH 200X) are emphasized. This class is for students intending to take Calculus I. Note: Only eight credits total may be earned from MATH F107X, MATH F108, and MATH F194X. Prerequisite: Accuplacer College Math score of at least 70 or placement into Calculus I. (4+1)

11. COURSE CLASSIFICATIONS: Undergraduate courses only. Consult with CLA Curriculum Council to apply S or H classification appropriately; otherwise leave fields blank.

H = Humanities | | S = Social Sciences |

Will this course be used to fulfill a requirement for the baccalaureate core? If YES, attach form.	YES:	X	NO:	

IF YES, check which core requirements it could be used to fulfill:

O = Oral Intensive, Format 6		W = Writing Intensive, Format 7		X = Baccalaureate Core	X

11.A *Is course content related to northern, arctic or circumpolar studies? If yes, a "snowflake" symbol will be added in the printed Catalog, and flagged in Banner.*

YES | | NO | |

12. COURSE REPEATABILITY:

Is this course repeatable for credit?	YES		NO	X

Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).	

How many times may the course be repeated for credit?		TIMES
If the course can be repeated for credit, what is the maximum number of credit hours that may be earned for this course?		CREDITS
If the course can be repeated with <u>variable</u> credit, what is the maximum number of credit hours that may be earned for this course?		CREDITS

13. GRADING SYSTEM: *Specify only one. Note: Changing the grading system for a course later on constitutes a Major Course Change - Format 2 form.*

LETTER: | X | PASS/FAIL: | |

RESTRICTIONS ON ENROLLMENT (if any)

14. *PREREQUISITES*	An Accuplacer College Math score of at least 70 or placement into MATH 200X Calculus I.

These will be *required* before the student is allowed to enroll in the course.

15. *SPECIAL RESTRICTIONS, CONDITIONS*	

16. *PROPOSED COURSE FEES*	$25

Has a memo been submitted through your dean to the Provost for fee approval?
Yes/No

Yes

17. *PREVIOUS HISTORY*

Has the course been offered as special topics or trial course previously? Yes/No	NO

If yes, give semester, year, course #, etc.:	

18. *ESTIMATED IMPACT*
WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.

This course will be offered in place of one section of MATH 108, a 3 credit math course. Thus, we have added one credit to the total number of credits DMS must teach each semester, a small addition. However, in the long run, we expect the course to reduce the DMS teaching load by allowing appropriate students to take a single 4-credit course to prepare for MATH 200 Calculus I instead of two courses for a total of 7 credits.
This course will require extensive use of a computer lab. As a result, enrollment in the course will be strictly limited to available resources.

19. *LIBRARY COLLECTIONS*
Have you contacted the library collection development officer (kljensen@alaska.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

No	X	Yes		

20. *IMPACTS ON PROGRAMS/DEPTS*
What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)

All programs that require Calculus I have the potential to be affected. Well-prepared students would have a shorter path to enrollment in Calculus I. If this trial course approved, DMS will meet in person with advisors in CNSM, CEM, and the Advising Center to both advertise the course and help advisors know how to identify appropriate students for the course.

21. *POSITIVE AND NEGATIVE IMPACTS*
Please specify positive and negative impacts on other courses, programs and departments resulting from the proposed action.

Positive: Progressing through mathematics requirements is a major hurdle for many students. This course will offer a shorter path for those students who need to complete Calculus I, are close to being prepared to enroll in calculus, but still need to address some deficiencies in their mathematical background. As examples, a student who placed into Calculus I with SAT scores and had to withdraw due to poor prerequisite knowledge or a student who has completed courses in precalculus, but delayed enrollment in calculus would be targets of this course. Another issue this course addresses is delay between prerequisite completion and calculus enrollment. Under the present scheme, this lag is typically one year. Students in this trial course would be in a position to drop that to one semester. Finally, by narrowing the goal of the course explicitly to preparation for calculus, the topics and expectations can be more tightly tied to that goal.
Negative: None.

The purpose of the department and campus-wide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. Use as much space as needed to fully justify the proposed course.
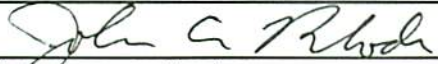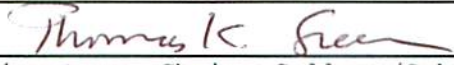
With the present curriculum offerings, a student who needs to take Calculus I and who is not prepared to take Calculus I will need to pass both MATH 107X Functions for Calculus (4.0 credits) and MATH 108 Trigonometry (3.0 credits) in order to satisfy the prerequisites for Calculus. Most students in this situation take these courses consecutively, not concurrently, which effectively delays enrollment in Calculus I by about a year. This path has the added disadvantage that the material on non-trigonometric functions is learned multiple semesters before it is applied in Calculus. Finally, over the years, MATH 107X has come to be used as a terminal core math course for the majority of enrolled students. A recent DMS study found that only 42% of students who *pass* MATH 107X even *attempt* Calculus I. This group constitutes a mere 27% of enrolled MATH 107X students.

The proposed course has higher prerequisite requirements than MATH 107X and MATH 108X, explicitly targets students who intend to take calculus, and is both individualized and mastery-based. The majority of outside-of-class work will be tailored to the student's particular weaknesses. So a student who shows mastery of polynomial functions and weakness in exponential functions will be able to skip homework on one and work exclusively on the other. The course syllabus is constructed to encourage students to master all topics, not just 70% of them.

Ultimately, we believe a version of this course will run with at least two sections every semester. That is, we expect this to be a high-demand, multiple-section course. The purpose of running a trial course is to try to identify and address problems with the syllabus, the use of Aleks, and the implementation of multiple test-attempts before enrolling large numbers of students.

We want this course to be designated as satisfying the core math requirement since the material in an existing core course, MATH 107X, is contained in its entirety in the material of MATH 194X. The alternative is that all students completing MATH 194 petition to have it count as core retroactively.

APPROVALS: Add additional signature lines as needed.

	Date	9/4/2013
Signature, Chair, Program/Department of:	Mathematics + Statistics	
	Date	9-26-13
Signature, Chair, College/School Curriculum Council for:	CNSM	
	Date	9/27/13
Signature, Dean, College/School of:	CNSM	

Offerings above the level of approved programs must be approved in advance by the Provost.

	Date	
Signature of Provost (if above level of approved programs)		

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

	Date	

Signature, Chair
Faculty Senate Review Committee: ___Curriculum Review ___GAAC

___Core Review ___SADAC

ADDITIONAL SIGNATURES: (As needed for cross-listing and/or stacking)

	Date	

Signature, Chair,
Program/Department of:

	Date	

Signature, Chair, College/School
Curriculum Council for:

	Date	

Signature, Dean, College/School
of:

ATTACH COMPLETE SYLLABUS (as part of this application). This list is online at: http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures-/uaf-syllabus-requirements/
The Faculty Senate curriculum committees will review the syllabus to ensure that each of the items listed below are included. If items are missing or unclear, the proposed course (or changes to it) may be <u>denied</u>.

SYLLABUS CHECKLIST FOR ALL UAF COURSES
During the first week of class, instructors will distribute a course syllabus. Although modifications may be made throughout the semester, this document will contain the following information (as applicable to the discipline):

1. **Course information:**
 ❑Title, ❑ number, ❑credits, ❑prerequisites, ❑ location, ❑ meeting time
(make sure that contact hours are in line with credits).

2. **Instructor (and if applicable, Teaching Assistant) information:**
 ❑ Name, ❑ office location, ❑ office hours, ❑ telephone, ❑ email address.

3. **Course readings/materials:**
 ❑ Course textbook title, ❑ author, ❑ edition/publisher.
 ❑ Supplementary readings (indicate whether ❑ required or ❑ recommended) and
 ❑ any supplies required.

4. **Course description:**
 ❑ Content of the course and how it fits into the broader curriculum;
 ❑ Expected proficiencies required to undertake the course, if applicable.
 ❑ Inclusion of catalog description is *strongly* recommended, and
 ❑ Description in syllabus must be consistent with catalog course description.

5. ❑ **Course Goals (general), and (see #6)**

6. ❑ **Student Learning Outcomes (more specific)**

7. **Instructional methods:**
 ❑ Describe the teaching techniques (eg: lecture, case study, small group discussion, private instruction, studio instruction, values clarification, games, journal writing, use of Blackboard, audio/video conferencing, etc.).

8. **Course calendar:**
 ❑ A schedule of class topics and assignments must be included. <u>Be specific</u> so that it is clear that the instructor has thought this through and will not be making it up on the fly (e.g. it is not adequate to say "lab". Instead, give each lab a title that describes its content). You may call the outline Tentative or Work in Progress to allow for modifications during the semester.

9. **Course policies:**
 ❑ Specify course rules, including your policies on attendance, tardiness, class participation, make-up exams, and plagiarism/academic integrity.

10. **Evaluation:**
 ❑ Specify how students will be evaluated, ❑ what factors will be included, ❑ their relative value, and ❑ how they will be tabulated into grades (on a curve, absolute scores, etc.) ❑ Publicize UAF regulations with regard to the grades of "C" and below <u>as applicable</u> to this course. (Not required in the syllabus, but is a convenient way to publicize this.) Link to PDF summary of grading policy for "C":
 http://www.uaf.edu/files/uafgov/Info-to-Publicize-C_Grading-Policy-UPDATED-May-2013.pdf

11. **Support Services:**
 ❑ Describe the student support services such as tutoring (local and/or regional) appropriate for the course.

12. **Disabilities Services:** Note that the phone# and location have been **updated.**
 http://www.uaf.edu/disability/ The Office of Disability Services implements the Americans with Disabilities Act (ADA), and ensures that UAF students have equal access to the campus and course materials.
 ❑ State that you will work with the Office of Disabilities Services (208 WHITAKER BLDG, 474-5655)to provide reasonable accommodation to students with disabilities.

5/21/2013

Instructor: Jill Faudree
Contact Details: Chapman 301D, jrfaudree@alaska.edu, 474-7385
Office Hours: MW 1:00pm-2:00pm, T 12:45pm-1:45pm, and by appointment. Also, you are welcome to drop by.
Textbook (required): *Precalculus: Mathematics for Calculus*, Stewart, Redlin & Watson, (ISBN 13: 978-1-133-59476-5)
Lecture Hours: MWF 11:45am-12:45pm Duck 252, T 11:30am-12:30pm Duck 252
Lab Hour: Th 11:30am-12:30pm Duck 252
Course Web Page: on UAF Blackboard.
ALEKS (required): The Aleks component of the course can be found at http://www.aleks.com/. You should self-enroll using the class key: **uaf 1391 5753**
TENTATIVE Midterm Dates: Friday 15 February, Friday 8 March, Friday 12 April
Final Exam: Tuesday May 7, 3:15-5:15pm *(NOTE: This is not the standard time slot for MWF 11:45-12:45 courses.)*
Prerequisites: a score of 70 or more on the Accuplacer College Math test or placement into MATH 200X Calculus I

COURSE DESCRIPTION

From the course catalog:

> MATH F194X Preparation for Calculus
> 4 Credits
> Various classes of functions and their graphs are explored numerically, algebraically and graphically. Function classes include polynomial, rational, exponential, logarithmic and trigonometric. Skills and concepts needed for calculus (MATH 200X) are emphasized. This class is appropriate for students intending to take Calculus I. Note: Only eight credits total may be earned from MATH F107X, MATH F108, and MATH F194. Prerequisite: Accuplacer College Math score of at least 70 or placement into Calculus I. (4+1)

This course is for students intending to take MATH 200X Calculus I. It is not for students only trying to fulfill a Baccalaureate Core math requirement.

COURSE GOALS:

Generally we will cover the background material needed to learn and understand Calculus. This will include a study of polynomial, rational, exponential, logarithmic, and trigonometric functions. For each family of functions, we will cover its definition, its algebraic formulation, its numerical

properties, and it graphical characterizations. It is also useful for the student to recognize that the structure of this course emphasizes *mastery* of *all* of the material, since Calculus I students will need to have facility with each of the topics covered.

STUDENT LEARNING OUTCOMES:

In the list below, the *standard type of function or expression* refers to the list of functions in the course description: polynomial, rational, exponential, logarithmic, and trigonometric. After completing this course, students will be able to:

- identify and find solutions to equations and inequalities of the standard set of functions.

- simplify expressions of the standard types.

- graph and interpret graphs of the standard functions.

- understand the basic properties of functions generally.

- apply a variety of techniques to find solutions to given equations.

- move between numerical, algebraic, and graphical representations of the standard set of functions with facility.

- apply both the unit circle definition and the triangle definition to evaluate or graph trigonometric functions.

INSTRUCTIONAL METHODS:

This is a "hands-on" mathematics class. The four designated lecture hours will consist of short over-view lectures followed by in-class work including quizzes. There is also a one-hour lab session that will consist entirely of in-class work. For this lab hour, you may bring your own laptop. If you do not have a laptop or do not want to use your laptop, one will be provided for you. As in any math class, the majority of the learning occurs in the out-of-class homework assignments, which will be extensive. A student should expect to spend a minimum of 10 hours per week outside of class completing homework assignments, reading the text and class notes, and preparing for tests and quizzes.

COURSE CALENDAR (TENTATIVE):

1. (week 1) A Review of the Fundamentals, Part I: real numbers, exponents and radicals, algebraic and rational expressions and equations. 1.1-1.5

2. (week 2) A Review of the Fundamentals, Part II: modeling with equations, inequalities, coordinate geometry and graphing. 1.6-1.8, 1.10

3. (week 3) Functions, Part I: definition, graphical implications, reading graphs, average rate of change. 2.1-2.4

4. (week 4) Functions, Part II: transformations of functions, combinations of functions, one-to-one functions and inverses, 2.5-2.7

5. (week 5) Polynomial Functions: quadratics, higher-order polynomials, division of polynomials, zeros of polynomials. 3.1-3.4

6. (week 6) Rational Functions: definition and graphs of rational functions. 3.7; Review. Test I on Chapters 1,2, and 3.

7. (week 7) Exponential and Logarithmic Functions, Part I: definitions and basic properties of exponential and logarithmic functions. 4.1-4.4

8. (week 8) Exponential and Logarithmic Functions, Part II: equations containing exponential and logarithmic expressions, modeling with exponential and logarithmic functions. 4.5-4.6

9. (week 9) Unit Circle Definition of Trigonometric Functions: definitions, graphs, inverse trigonometric functions. 5.1-5.4

10. (week 10) Review. Test II on Chapters 4 and 5. A first look at the Right Triangle Approach to Trigonometric Functions. 6.1-6.2

11. (week 11) More on the Right Triangle Approach: definitions, inverse functions, law of sines, law of cosines. 6.3-6.6

12. (week 12) A Brief Look at Trigonometric Identities: Fundamental identities will be emphasized. 7.1; A quick look at other identities. 7.2-7.3. Trigonometric inequalities. 7.4

13. (week 13) Systems of equations. 10.1; Review. Test III over Chapter 6, 7, and 10.1.

14. (week 14) Putting it all Together: a comprehensive look at all the families of functions covered in this course, cataloging and comparing both algebraic and graphical representations; a comprehensive look at trigonometric functions including both definitions, when to use which one, and identities; a comprehensive look at functions generally including defining properties and those of inverse functions. Practice Prerequisite Test for MATH 200X. Final Exam.

COURSE POLICIES:

Attendance is mandatory. A student with regular unexcused absences will be withdrawn for lack of participation.

Aleks Objectives that align with the weekly lecture topics will be due by Saturday night (technically Sunday morning at 12:00am). All students are expected to master 100% of the objective by that time. Scores for Aleks Objectives are assigned as follows:

% Objective	Score
100	4
90 - 99	3
80 - 89	2
0-79	0

Think about what this grading scheme implies. Failure to achieve mastery on a particular Aleks Objective results in a loss of 25% of your Aleks points for that objective. Since (as you will see below) your Aleks points comprise 10% of your overall grade, a loss of 25% of your Aleks points over the whole semester corresponds to a loss of 2.5 points to your overall average. (!!)

Note that the final Aleks Objective will consist of a Final Assessment that covers all the topics of the course. It will be proctored. A student who does not score at least 75% on the Final Assessment will lose one letter grade on his/her *overall* grade. The Final Assessment can be taken up to three times total.

In-Class Quizzes will be given multiple times a week and consist of a couple of problems to work in 10 minutes. The problems will be like the ones on Aleks, the ones we do in class, and the ones in your text. Their purpose is to prepare you to write mathematics and to prepare you for the tests. No make up-quizzes are allowed. A student may drop 2 quizzes.

The **Lab Hour** is mandatory. You have have two excused absences. Any unexcused absences or absences in addition to the two excused ones will result in a loss of 5% from your Aleks Points for each absence. The purpose of the lab is to provide you with the opportunity to work with Aleks in the presence of an knowlegeable TA. This time is set aside to address problems you have with the Aleks program or mathematical issues related to Aleks. Tests and quizzes will sometimes be given during this lab time also.

Tests will be written on paper, without the use of books, notes, or a calculator. All students will be given the opportunity to re-test on a particular collection of topics. So if a student is unhappy with the grade earned on a particular test, the student can choose to take a second test on this material. Be advised that the second test, while over the same material, will be different from the first test. This is NOT a re-do of the original test. The grades on the two tests will be AVERAGED.

Grades will be calculated according to the following:

Aleks Points	10%
in-class quizzes	10%
Test I (average)	20%
Test II (average)	20%
Test III (average)	20%
Final Exam	20%

Grade Bands: A, A- (90 - 100%), B+,B, B- (80 - 89%), C+, C, C- (70 - 79%), D+, D, D- (60 - 69%), F (0 - 59%). I reserve the right to lower the thresholds.

I repeat for emphasis that the final Aleks Objective will consist of a Final Assessment that covers all the topics of the course. It will be proctored. **A student who does not score at least 75% on the Aleks Final Assessment will lose one letter grade from the calculation above.**

Tutoring is available at no extra cost, on a walk-in basis, at the Math Lab in Chapman 305. Hours will be announced and posted on the door. A good way to use the Math Lab is to simply go there to do your homework, so that if any questions arise you can get immediate help.

Course accommodations: If you need course adaptations or accommodations because of a disability, please inform your instructor during the first week of the semester, after consulting with the Office of Disability Services, 203 Whitaker (474-7403).

University and Department Policies: Your work in this course is governed by the UAF Honor Code. The Department of Mathematics and Statistics has specific policies on incomplete grades, late withdrawals, and early final exams, some of which are listed below. A complete listing can be found at http://www.dms.uaf.edu/dms/Policies.html.

Late Withdrawal: This semester the last day for withdrawing with a *W* appearing on your transcript is March 22. If, in my opinion, a student is not participating adequately in the class, I may elect to drop or withdraw this student. Inadequate participation includes but is not limited

to: missing an exam, repeatedly failing to take quizzes or to complete Aleks objectives, or having a failing average (below 70%) at the withdrawal date.

Academic Honesty: Academic dishonesty, including cheating and plagiarism, will not be tolerated. It is a violation of the Student Code of Conduct and will be punished according to UAF procedures.

Courtesies: As a courtesy to your instructor and fellow students, please arrive to class on time, turn off your cell phones and other electronic devices (unless using them to take notes), and pay attention in class.

Additional Background for the Syllabus for MATH 194X Preparation for Calculus

Aleks

Aleks is a web-based assessment and learning program. It can be directly aligned with a number of precalculus textbooks. An instructor can assign problems from a particular section of the textbook by means of Aleks Objectives. These problems will be similar to those in the text, but not the exact same problems. Answers are generally fill-in-the-blank, though there is a graphing tool too and sometimes answers require using this tool to graph a function. There are no multiple choice questions. Aleks also has help and tutorials related to each section of material. Normally an Aleks Objective would contain more than a single section of material. Most instructors set objectives by topic. For example, most instructors would have an Exponential Functions Objective (which would cover Section 4.1, 4.4, and 4.5 of the Larson text).

The most crucial property of Aleks is that it is *adaptive*. Once I set my students the hypothetical Exponential Functions Objective due Saturday March 8, when they log into Aleks, they will all be asked questions about exponential functions but different students will be asked different questions. In particular, a student who correctly graphs several exponential functions will move immediately into a couple of questions about using exponential functions to calculate compound interest. On the other hand, a student who does not answer a graphing question correctly will be given an easier problem and a tutorial. That student will answer a few more questions in this area and not be able to "get credit" for this topic until correctly graphing these functions three times in a row. This allows students to spend more time in the areas in which they need more help. It simultaneously prevents a student from moving forward if they have not mastered some earlier basic topics. For example, students can be prevented from tackling the Logarithmic Objective without mastering at least 85% of the topics in the Exponential Objective. In summary, faster or better-prepared students can go more quickly through the material and spend more time on the more difficult topics while less-prepared students can be forced to spend time mastering those topics crucial to understanding later material.

The Role of the Lab Hour

The department has used Aleks before, both as a mandatory part of class and as an optional add-on to a class. In these contexts, we have found it is important to have a venue for addressing technical issues related to Aleks. In particular, what sometimes appears as a technical issue to the student (Aleks keeps counting my answer is incorrect when I know it is right) is often, in fact, a mathematical one and, most importantly, is best handled on the spot. That is, having students work on Aleks in the presence of an Aleks-knowledgeable and mathematically-knowledgeable person is an extremely effective way of ensuring students continue to make progress and don't get mired down in logistics.

Also, this lab hour will also be used to gauge student progress outside of class. Since Aleks keeps track of the number of topics mastered over time, we will be able to tell how productive a student is being outside of class. For example, if we see a student who regularly completes 5 topics per hour during the

lab hour but is completing less than 2 topics per hour outside of class, the instructor or the TA can bring this to the attention of the student and attempt to remedy any problems. If we see a student spent 45 minutes on one particular topic, the TA can address this topic with this student directly in the lab.

The Lab Hour will be mandatory for all students. Students will be allowed two excused absences during the whole of the semester. Any unexcused absences or absences in addition to the excused two will result in a loss of 5% from their homework average for each absence.

Friday 1 February 2014   NAME:_____

No calculators, notes, books, or aids of any kind. You must show your work to receive full-credit. This quiz has two questions is worth 20 points.

(1) (10 points total) Given the quadratic function $f(x) = 2x^2 + 4x + 3$, answer the following questions.
   (a) (5 points) Express the function in standard form.

   (b) (5 points) Find its vertex and any $x-$ or $y-$intercepts.

(2) (10 points) A rectangle has an area of 16 square meters. Find a function that models is perimeter P in terms of the length x of *one* of its sides.

Let $f(x) = \sqrt{x-1}$ and let $g(x) = x^3 + 2$.
(1) Evaluate the expressions below or state that they are undefined.

(a) $f(g(0))$

(b) $g(f(0))$

(c) $g(f(9))$

(d) $(g+f)(10)$

(2) Find the domain of:

(a) $f(g(x))$

(b) $g(f(x))$

(c) $(f+g)(x)$

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Tom Green <tkgreen@alaska.edu>

Math 194X Trial Course

Jill Faudree <jrfaudree@alaska.edu>   Wed, Sep 25, 2013 at 6:14 AM
To: Tom Green <tkgreen@alaska.edu>
Cc: Jessica Larsen <jflarsen@alaska.edu>, Channon Price <cpprice@alaska.edu>

Hello Tom, Jessica, and Channon,

Thank you for your work and I will jump in to the specifics of your comments.

1) Is the request for the core designation sufficiently justified in the
proposal?

The argument is that MATH 194 takes the material from MATH 107 (an existing core course) and adds in
additional material (from MATH 108). Effectively, the 194 syllabus is constructed by deleting an extended
review of **prerequisite** material from the 107 syllabus and replacing it with new mathematics, trigonometry. The
fact that the argument is short doesn't mean it is wrong or insufficient.

In the history of the core curriculum as I know it, no objection has ever been made for any math course
satisfying the math core requirement except on two grounds: (1) the mathematics isn't really college-level math
(example: DEVM 105/106) or (2) the course isn't sufficiently broad (example: MATH 108). If MATH 107 is
college-level, so is MATH 194. If MATH 107 is sufficiently broad, so is MATH 194. Or, more directly, if 107
includes deducitve reasoning, problem solving, logical thinking, and applications of mathematics, then so does
MATH 194.

Objection here is genuinely a puzzle to me.

(2) As per the proposal for the trial course MATH 194X, Math 194X contains
Math 107X "in its entirety". Also as per the same proposal, a student
would be able to get credit for taking both MATH 107X and MATH 194X. It
seems then to be possible to a student to take Math 107X and then Math
194X, which contain the same material, and thus satisfy their math core
requirements (two core courses) by in essence mastering one course worth of
material? We understand the desirability to fast-track students whose goal
is Calculus. Thus, we wonder if, since that end will also get those
students two core courses (assuming that the proposal for MATH 194X is
approved as written and MATH 194X is awarded the core designation), is it
desirable to allow students to get credit for both MATH 107X and MATH 194X?

You are right and thank you for catching this. It should be changed so that one **cannot** get credit for both MATH
107 and MATH 194.

Finally, I want to emphasize that we very much want to run a trial in the Spring. We think getting started on the
process of revamping the pipeline into Calculus is more important than the core designator especially with new
core guidelines (or whatever it will be called) on the horizon.

Let me know what I should do.

Thanks again,
Jill

[Quoted text hidden]

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