RESOURCE WEBSITE FOR APPLIED MATH 30

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MASTER OF EDUCATION

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Abstract

To complete the requirements of a one-course project of the Masters of Education degree at the University of Lethbridge, I have chosen to design and build a website for the recently implemented Applied Math 30 program. The major objective of the Applied Math 30 website is to be a supplemental resource for students to utilize while they are part of a formal classroom setting. This website has not been designed as a replacement tool for students who wish to take this course via distance learning. A second objective is to develop a framework in which others may utilise and build upon for both this Applied Math 30 course, as well as other math programs throughout the province of Alberta. The website as it currently stands will be given to Alberta Learning so that it may be distributed to teachers and other educators to build upon or to use with their students.

Acknowledgments

Thanks must be given to the following people for their assistance during the creation of this project: Dennis Burton for his comments and suggestion as well as his willingness to ensure our computers were always working; Elaine Jacklynn for her comments and suggestions as well as her valuable input into the "Kayaking the Clayquout Sound" assignment; Phil Mcrae for his comments and suggestions as well as introducing me to the Hot Potatoes program which so greatly added to the usefulness of the website; My Applied Math 30 students from the Fall of 2000 and the Spring of 2001 for their evaluation and criticisms of the site. Looking into their faces each day was my inspiration to produce this site; Dr. Brian Titley and Dr. Craig Loewen for their valuable feedback, criticisms, suggestions and patience during the development of this website.

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Introduction

To complete the requirements of a one-course project of the Masters of Education degree at the university of Lethbridge, I have chosen to design and build a website for the recently implemented Applied Math 30 program. This document represents an overview and summary of the process that was undertaken in this development. It in no way represents an exhaustive research of the existing literature with regard to education and the internet. A study of this nature would represent a body of work representing a distinct project on its own.

Objectives

The major objective of the Applied Math 30 website is to be a supplemental resource for students to utilise while they are part of a formal classroom setting. This website has not been designed as a replacement tool for students who wish to take this course via distance learning.

A second objective is to develop a framework in which others may utilise and build upon for both this Applied Math 30 course, as well as other math programs both in Lethbridge Collegiate Institute and throughout the province. The website as it currently stands will be given to Alberta Learning so that it may be distributed to teachers and other educators to build upon, tear apart, or just use with their students.

Website Development Process

In setting out to establish this website, I decided that it would be best to follow the life cycle of the development of any technical cycle. As this website will need to exist within the technical computer world of a large cycle, it would have to adhere to processes of the implementation of new technologies.

Recognition

The first step in this process was to recognize that there existed a gap between the

communications of students who are taking short-term or extended leaves of absence from their studies. So often during the school year, students leave for band trips, athletic tournaments, family vacations, tours arranged by the Travel Club or even illness. It is accepted truth that student presence in the classroom is crucial in the education of students learning in a school-based environment (as opposed to a true "virtual school" such as St. Gabriel Cyber School (www.stgabe.com) based in Red Deer. If they must be absent due to circumstances beyond their control, I believe that it is incumbent upon the education system to facilitate a minimal disruption in their learning. The seed for the development of this website was the desire to maintain communication with students during these absences.

Analysis

As the problem is essentially fostering the learning of the outcomes from the program of studies while away from the classroom, the solution lies in some mode of telecommunication. Various methods were analyzed, each with its own merits and drawbacks.

Teleconferencing. While beneficial in that the teacher and student are able to maintain a direct human interaction, this benefit is overwhelmed by the financial cost ot taking over the phone for extended periods of time. While the private sector views this technology as integral to their operation, school systems do not share the luxury of extended resources. A second drawback to this technology is the potential for large time-zone differences between the locations for the teacher and the student. As this technology is based upon real-time communication, one or both parties would be tremendously inconvenienced in order to maintain contact.

Video conferencing. Same as above but with the financial implications multiplied at least tenfold.

<u>Design</u>

After deciding that an internet-based system was the most desirable, the next step was to design the actual layout of the site. While this may sound like a relatively simple process, it is actually the most important step. Because of the interconnected nature of a website, it is the rare designer that will jump into creating a full website with the first page, while not having a vision of what the entire site will entail. I referred to this overall vision as the skeleton of the finished product. It made no sense to fill in the veins and muscles of one particular section of the site until I was certain that there would be no major structural changes required. The ultimate design (Appendix 1) is based upon the structure of my own classroom, including my classroom rules, and homework and journal questions which other teachers may not find particularly useful.

<u>Refinement</u>

There has been very little in the way of refinement since I began with my original design. In consultation with both those who are technologically proficient and those who are less so, the comments were generally positive and no major deletions or additions were suggested. It is hope that other teachers within the Lethbridge Collegiate Institute (LCI) and the province through the Alberta Online Consortium will make the necessary additions and adjustments to make this a useful site for students across the province.

<u>Implementation</u>

The implementation of this website will not occur until the Spring of 2002 as several other teachers at LCI have agreed to contribute to particular unit sections prior to that time.

<u>Training</u>

Although I do not believe that there is a need for specialized training to utilise the website, I do recognize that it would be useful to include a section indicating the

procedures for navigating through the site and the Power Point tutorials.

<u>Maintenance</u>

While designing and developing this website has been a time consuming process, the maintenance of the website is also an onerous task, particularly for what is essentially a volunteer position within our traditional education system. There are currently no moneys within schools to pay for a person to maintain a website as occurs within virtual schools and the private sector. Currently there is no person designated as the maintenance webmaster at LCI; however if the website is utilized by the Alberta Online Consortium, such a position may become a reality.

<u>Retirement</u>

An accepted fact of today's' educational technology age is that nothing id forever. I believe that I must be realistic concerning the life span of this website. Another teacher or computer person may design a much better layout for this website, with better resources and more interactive pedagogical tools, thereby making this site redundant. For that matter, the whole Applied Math 30 curriculum may be changed at some point in the future, whereby a new curriculum would be written and an opportunity for another person to develop such a site.

<div align="center">Programs Used</div>

The following software programs were all used to a lesser or greater extent in the development of this website:

1. Netscape Composer was used to compose, edit and publish individual webpages.

2. Microsoft FrontPage was also used to compose, edit and publish pages but was also integral in the website as a whole with regard to tracking links over the entire website.

3. Swish is an animation program used to create the logo of the main page.

4. Wingif is one of the graphic manipulation programs used.

5. Microsoft Photo Editor is also a graphic manipulation program used.

6. Wordpad was used to edit HTML codes at the specific program code level.

7. Mathtype was used to place mathematical symbols in various parts of the website.

8. The Word Art feature of Microsoft Word was used to create the various page-heading styles.

9. Microsoft Powerpoint was used to create the individual slides of the specific outcomes.

10. Hot Potatoes is an excellent program for generating multiple choice, true/false, and other evaluation instruments for both on- and off-line use.

The following websites were utilized and I thank the developers for such easy access to such valuable additions to my project:

1. http://sitelevel.whatUseek.com was the search engine for the website.

2. http://Freedback.com was the cgi engine for the student information form.

3. http://www.shodor.org/interactive_dev/activities/spinner was the JavaScript for spinner.

Evaluation

As with projects of this type, there are always improvements that can be made and a website is never really finished. In order for a website to be relevant and applicable, there are always additions and deletions, modifications and updates that must occur. This section will attempt to evaluate this website in its current form, beginning with a critical evaluation survey based on the work of Kathleen Schrock (http://www.capecod.net/schrockguide).

Technical and Visual Aspects of the Web Page

1. Does the webpage take a longtime to load?

Using Netscape, there is very little load time on any of the pages. I have noticed that with MS Explorer (5.5) the title page that contains the Swish heading can take a significant amount of time to load. I am unsure as to the cause of this as I have seen other Swish applets work on this platform. As simple solution to this would be to remove this applet.

2. Do the pictures add to the page?

I purposely limited the graphics and images within the site to facilitate a fast load time but as the objective-specific tutorials are added, there would be a need to add images to facilitate the learning process.

3. Is the spelling correct on the page?

Yes, there are no spelling errors to my knowledge anywhere on the site.

4. Is there a date of last update?

No. This would be something that would have to be included so those students who visit the site repeatedly would know which sections have been changed.

5. Is there an image map (large clickable graphic with hyperlinks) on this page?

No. This common feature was left off the site intentionally as in my discussions with students, I learned that the less experienced students find image maps confusing and difficult to follow. If they are unsteady with their hand on the mouse, they can very easily move to pages in which they do not wish to be.

6. Is there a table on the page? If so, is it readable with your browser?

Tables are necessary for efficient layout of webpages and I feel that I have utilized tables effectively in the site. I have encountered no problems with the tables in any browser.

7. If you have graphics turned off, is there a text alternate to the images?

I think this is the most glaring mistake that I made when constructing this website.

By not adding a txt alternative to graphics, I have left the user with no information as to the contents of the link. At some point in the future, this error would have to be corrected.

8. On supporting pages, is there a link back to the home page?

This process is actually more difficult than it would seem at first glance. With a website of this size, a developer has to be careful to include a sufficient number of links for the user to be able to navigate with a minimal amount of frustration, while at the same time, not to overload the user with so many links that they become overwhelmed. I believe that by using the Yin-Yang symbol throughout the second-level links, it is easy for the user to always return to the homepage if he or she becomes lost. One oversight that was made was the lack of a return link for students that complete the survey. Another addition with regard to links would be to create another summary page for students to access the specific chapter pages without having to go through the course outline page each time.

9. Are the links clearly visible and explanatory?

I do believe that the general usage of links is efficient and effective. The students that evaluated the website all responded positively to this question.

10. Is there sound or video included in the page?

There is no multimedia included in this website. I felt that the addition of multimedia could have been overwhelming for the purposes of this project; however sound and video could be very effective additions to the site in order to increase student comprehension.

Content

1. Is the title page indicative of the content?

Yes, I am confident that there would be no mistaking the content of the site from

the title.

2. Is the information useful for your purposes?

Currently this website is limited to usefulness for students except for the probabilities and statistics sections. Students have found the list of other websites that are included useful to their studies this year. As well students have found the homework and journal pages helpful when they have been working at home and have forgotten what assignments are due for the following day.

3. Would information somewhere else have been different?

Currently there are no existing websites that are designed for this new curriculum so students have no means of comparison to answer this question.

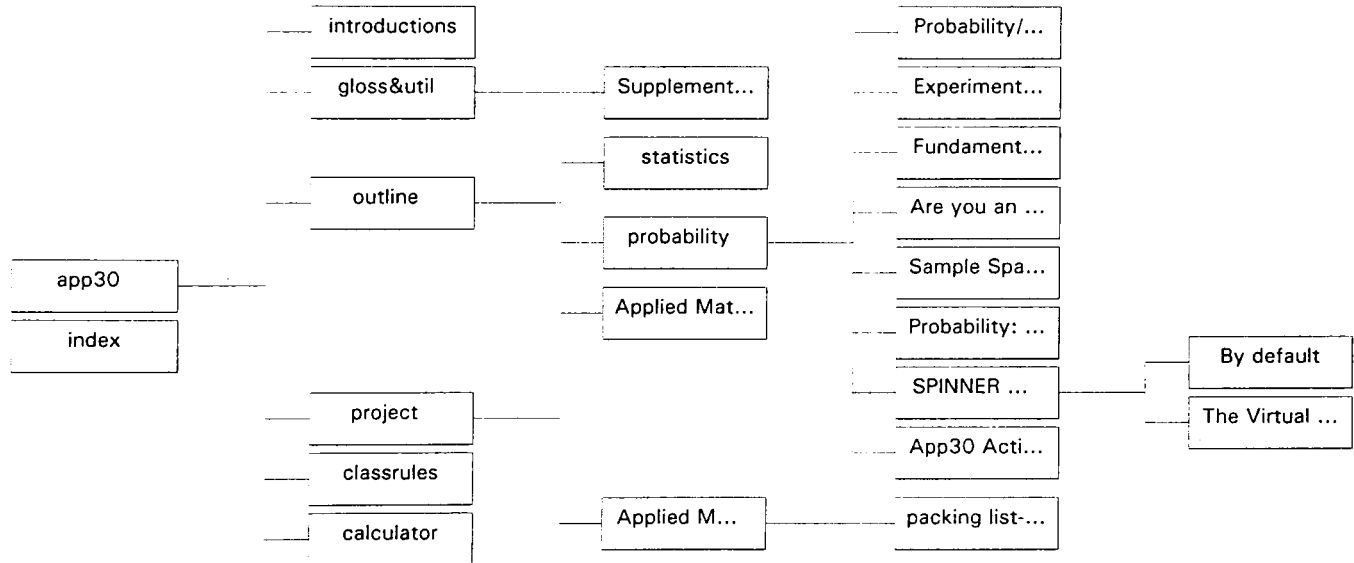4. Did the information lead you to other sources that were useful?

With the current state of the site, links to other sites are its most useful aspect. Although there are many resources available for college and university students as well as elementary children, there are few sites geared towards grade 12 students. By including links to these sites, students are saved the time consuming task of randomly "surfing" to find appropriate pages.

5. Does the information contradict something you found elsewhere?

I am confident that all of the information included is accurate. A valid criticism of the site might be the method of delivery; however this site is not meant to be an exclusive learning tool but an enhancement to include a variety of learning styles.

APPENDIX A:

Website Map

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                    ┌─────────────────┐                                                    ┌─────────────────┐
                ____│  introductions  │                                                ____│  Probability/...│
                    └─────────────────┘                                                    └─────────────────┘
                    ┌─────────────────┐         ┌─────────────────┐                        ┌─────────────────┐
                ____│   gloss&util    │─────────│  Supplement...  │                    ____│  Experiment...  │
                    └─────────────────┘         └─────────────────┘                        └─────────────────┘
                                                ┌─────────────────┐                        ┌─────────────────┐
                                            ____│   statistics    │                    ____│  Fundament...   │
                    ┌─────────────────┐         └─────────────────┘                        └─────────────────┘
                ____│     outline     │                                                    ┌─────────────────┐
                    └─────────────────┘                                                ____│  Are you an ... │
                                                ┌─────────────────┐                        └─────────────────┘
                                            ____│   probability   │─────────              ┌─────────────────┐
   ┌─────────────┐                              └─────────────────┘                    ____│  Sample Spa...  │
   │    app30    │──────                                                                    └─────────────────┘
   └─────────────┘                              ┌─────────────────┐                        ┌─────────────────┐     ┌─────────────┐
   ┌─────────────┐                          ____│  Applied Mat... │                    ____│  Probability: ...│     │  By default │
   │    index    │                              └─────────────────┘                        └─────────────────┘     └─────────────┘
   └─────────────┘                                                                         ┌─────────────────┐     ┌─────────────┐
                                                                                       ____│   SPINNER ...   │─────│ The Virtual ...│
                    ┌─────────────────┐                                                    └─────────────────┘     └─────────────┘
                ____│     project     │──────                                              ┌─────────────────┐
                    └─────────────────┘                                                ____│  App30 Acti...  │
                    ┌─────────────────┐                                                    └─────────────────┘
                ____│    classrules   │                                                    
                    └─────────────────┘         ┌─────────────────┐                        ┌─────────────────┐
                    ┌─────────────────┐      ___│   Applied M...  │────────────────────____│  packing list-...│
                ____│   calculator    │         └─────────────────┘                        └─────────────────┘
                    └─────────────────┘
```

APPENDIX B:

Hard Copy of the Website

Due to the nature of the webpage, it is difficult to print and organize these pages in a logical sequence to replicate the on-line version. Those wishing to view the website in html format should point their browser to

http://lethsd.ab.ca/lci/staffwebpages/peregoodoff

The pages that include the Hot Potatoes online questions included here in no way reflect their actual online appearance. For reasons unknown to me, I am only able to print these pages in raw text format.
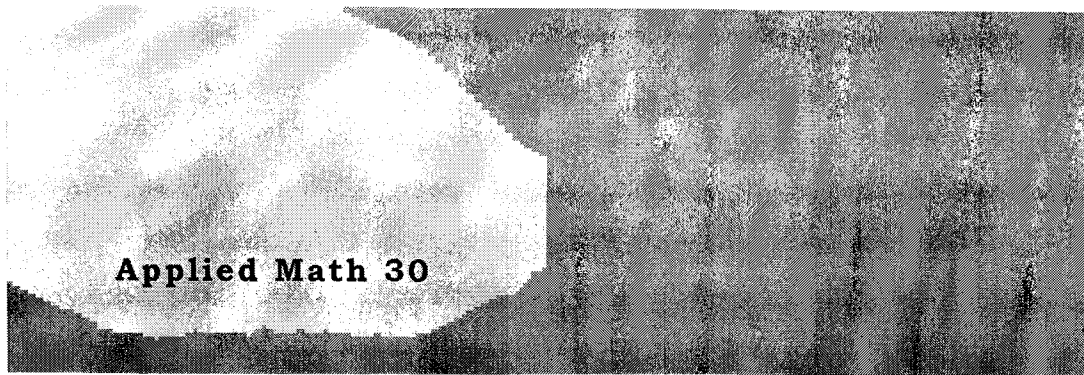
Applied Math 30

Lethbridge Collegiate Institute

The use of this website is limited to students and staff of LCI. To carry on further, you will need the password, sorry. If you are interested in finding out more about this site, you may contact the webmaster

Click here to enter

Applied Math 30

Welcome to the home of the new Applied Math 30 course. We hope that all who enter find it both useful, and a supplement to their classroom work.

| Introductions | Course Outline | Calculator Policy | Classroom Rules | Course Project | Glossary and Utilities | LCI homepage |

Search This Site ▼ for [   ] | Search |
Get a Free Search Engine for Your Web Site

This is the Home Page. If you would like to return to this page from anywhere within the site, simply click on the Yin Yang symbol.

zoomerang™

Course Evaluation

1 Enter the course being evaluated:

2 Reason course was taken:

- ⬤ Required for Major
- ⬤ Required for Minor
- ⬤ Elective

Please rate each of the following on a 1-5 scale, where (1) is "Strongly Disagree," (2) is "Disagree," (3) is "No opinion/neutral," (4) is "Agree" and (5) is "Strongly Agree."

3 THE COURSE:

1 Strongly Disagree	2 Disagree	3 No Opinion/ Neutral	4 Agree	5 Strongly Agree

Syllabus accurately described course content and objectives

| 1 | 2 | 3 | 4 | 5 |

Assignments were reasonable and appropriate

| 1 | 2 | 3 | 4 | 5 |

Course pace and difficulty were appropriate

| 1 | 2 | 3 | 4 | 5 |

Exams and quizzes reflected important course aspects

| 1 | 2 | 3 | 4 | 5 |

Fellow students were academically prepared for the course

| 1 | 2 | 3 | 4 | 5 |

Class size was not too large for the subject and format

| 1 | 2 | 3 | 4 | 5 |

I would recommend this course to other students

| 1 | 2 | 3 | 4 | 5 |

6   Please list then describe any positive and/or negative factors about the course.

7   Do you have any suggestions for improving the course?

After answering all the questions, click the "submit"
arrow below to complete the survey.

SUBMIT

Introductions

Please take a few short minutes to complete the this form so that your teacher can better understand you and what will help you in math class.

Student Info
Entry Form
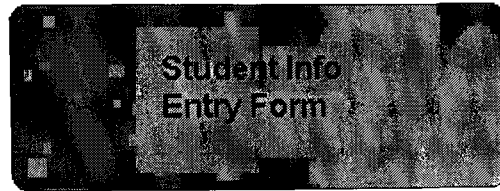
Student Demographics for Math 30 Applied

Your full name: [   ]

Your email address: (e.g.: *you@aol.com*) [   ]

Your phone number: [   ]

Address: [   ]
[   ]

City/Town: [   ] Prov.: [   ] Postal Code: [   ]

What mark did you receive in your last math class? [0 0]

Is there anything about yourself that I should know to help you be successful in math class?

[   ]

Which post-secondary institution do you wish to attend? ⦿ University ◯ College ◯ Technical School

Which method(s) of learning do you learn best
with? ☐ lecture ☐ textbook ☐ computer ☐ friends/classmates

What are your future goals after graduation?

[   ]

Thank you very much for completing this form, please send now or reset the form if you wish to make

some changes. Use your browsers **BACK** button to return to this page, then click on   to return
to the home page

Get your form NOW!
Freedback

[Send | Reset]
FREE feedback form powered by Freedback.com

Get your form NOW!
Freedback

Note that course outlines will also be distributed in class. In the event of a discrepancy between this web page and the hardcopy, the hardcopy will be taken as the accurate document.

<u>Major Topics</u>   <u>Textbook</u>   <u>Materials Required</u>   <u>Evaluation</u>   <u>General Comments</u>

Math 30 Applied - Course Outline*

The Program of Studies for Mathematics under the Western Canada Protocol was implemented at the grade ten level in September, 1998. This program features a marked change from the way Mathematics has been delivered in the province of Alberta. In the Applied Math Sequence, emphasis is placed on the applications of mathematics rather than on precise mathematical theory. The approaches used are primarily numerical and geometrical. Algebraic growth occurs as a result of solving the problems. This sequence is designed for those students who have experienced some difficulty in mathematics.

Major Topics

The following is a list of the topics that will be covered along with an indication of the approximate amount of time to be spent on each topic. Clicking on each topic will take you to the supplemental information on that topic, as well as review questions and websites to assist in your learning..

WEBLINKS FOR ALL TOPICS

Topic	Chapter(s)	Estimated number of periods
1. <u>Probabilites</u>	1	10
2. <u>Statistics</u>	3	8
3. Matrices and Pathways	2	17
4. Patterns and Fractals	5&6	18
5. Finance and Spreadsheets	4	17
6. Vectors	7	16
7. Design	Project Book	15

Text: Applied Mathematics 30 - <u>Addison Wesley</u>

You are responsible for your textbook. Textbooks are not to be written in. The text must be returned in good condition at the end of the semester. If you lose your text you will be expected to pay for it before a second one is issued. Cost of the text is $63.40.

<u>return</u>

Materials Required

In addition to a notebook or looseleaf paper you will need to provide the following for use during the semester:

- ruler
- graph paper
- coil back notebook for communication assignments
- pencils - all work must be done in pencil
- graphing calculator – students should check with their teacher prior to purchasing a graphing calculator.

return

Evaluation

Your final grade will be determined as follows:

1. 35% of final grade based on a comprehensive final exam.
2. 10% of final grade based on a comprehensive midterm exam.
3. 30% of final grade based on unit exams (there will be an exam at the end of each of the six units; all exams will count equally)
4. 10% based on communication/journal activities.
5. 5% based on quizzes and assignments.
6. 10% of final grade based on projects.

return

General Comments

1. Students are expected to attend classes regularly and punctually. Students should be in their desk with their books open when the bell rings.
2. Students are responsible for all work that they have missed if they are away for any reason.
3. If you know in advance that you will miss a class, you are expected to notify the teacher in advance and get the assignment so that the work is done when you return.
4. If you are absent on the day of a test, or when an assignment is due, you are expected to have your parents or guardian notify the teacher. Failure to do so could result in your receiving a mark of zero on that test or assignment. It is your responsibility to arrange to write any tests missed.
5. Homework is an integral part of this course. Assignments that are not completed during regular class time are to be completed at home. In addition, students should spend some time going over any new work introduced each day, as well as related topics. Generally, you should plan to spend about thirty minutes on homework each day.
6. Students who have difficulty keeping up with the material should contact their teacher and arrange for extra help outside of class time.

return

Links for the Applied Math 30 Program

(all links active as of June 12, 2001)

Return to outline page

Matrices

Matrix Algebra
Matrix Algebra (excellent)

Finance and Spreadsheets

MS Excel Tutorial
Mortgage Calculator
Mortgage Calculator
Financial Glossary

Sinusodial Patterns

Unit Circle

Vectors

Vector Algebra
Vector Tutorial
Vector Tutorial (excellent)
Navigational Vectors
Graphing Vectors - Java Applet
Introduction to Vectors (excellent)

Fractals and Patterns

The Fractory - Julia Set
The Fractal Microscope
Paper-Folding Fractals (excellent)
Fractal Tutorials (excellent)
Conway's Game of Life (excellent)

Statistics

Binomial Distribution
Genetics Probability

Probabilities

Probabilities in Monopoly
Standard Deviation Tutorial
Probability Tutorial
Probability Tutorial
Probability Tutorial - Java Applets (excellent)
Conditional Probability

Calculator Policy

As mandated by Alberta Learning, all students enrolled in the Applied Math course must have one of the following approved calculators. Other calculators will NOT be allowed in the classroom.

Some questions on tests in Math 30 Applied require the use of a graphing calculator.

Alberta Education has approved the following calculators for use by students. Only these calculators may be used.

Manufacturer	Models
Texas Instruments	TI-82, TI-83, TI-83plus, TI-86, TI-89, TI-92, TI-92plus
Casio	CFX-9850GA plus (FX-9700, CFX-9800G, CFX-9850G are approved but no longer manufactured)
Sharp	EL-9600 (EL-9200, EL-9300 are approved but no longer manufactured)

Mathematics 30 (old program) and Mathematics 33 require the use of a scientific calculator or an approved graphing calculator.

Procedures

1. At the beginning of any mathematics or science diploma examination course, teachers must advise students of the types of calculators approved by Alberta Learning for use when writing diploma examinations in these courses.
2. tudents must clear all programmable calculators, both graphing and scientific, that are brought into diploma examinations of all information that is stored in the programmable or parametric memory.
3. Students must not bring external devices (peripherals) to support calculators into any examination. Such devices itudents must not bring external devices (peripherals) to support calculators into any examination. Such devices include manuals, printed or electronic cards, printers, memory expansion chips or cards, external keyboards, CD-ROMs, libraries, or any annotations that outline operational procedures.
4. In preparation for calculator failure, students may bring extra batteries and/or approved calculators into the examination room.
5. During examinations, supervising teachers must ensure that

    • calculators operate in silent mode
    • students do not share calculators or information contained within them
    • calculator cases are not available to students
    • programmable calculator memories, including parametric memories, have been cleared
    • only graphing calculators on the current list approved by Alberta Learning are used

Calculator Criteria

The following criteria will be used to select acceptable calculators.

Minimum calculator properties required

1. Function graphing capabilities with display
—includes displaying more than one function on the screen at a time, tracing a function

2. Standard scientific calculator operations
—e.g., sine, cosine, tangent, inverse functions, logarithms, power (x^n)

3. Statistical functions in 1 and 2 variables
—mean, median, mode, standard deviation, bivariate data, regression models

4. List capabilities

5. Matrix capabilities
—scalar multiplication, addition, and subtraction

Unacceptable calculator properties during examinations

1. Built-in notes (definitions or explanations in alpha notation), e.g., libraries
2. Upgrades that include built-in notes
3. Remote communication ability

A list of approved calculators is provided on the last page of this policy to assist students and teachers in the selection of graphing calculators that conform to the requirements stated in the definition and to the stated criteria. The list will be updated annually.

> *Note: All the calculators listed below meet the "required properties". They do not have any "unacceptable properties" and so can be used on the mathematics and science diploma examinations. However, students and teachers should recognize that the different models of calculators listed have a range of capabilities, and the choice of which model to use or purchase will require personal or teacher analysis of the machines' capabilities and one's individual or school circumstances.*

The Approved List of Calculators

BRANDS	Casio	Sharp	Texas Instruments
MODELS	Algebra FX 2.0	El-9600C	TI-82* TI-83 TI-83 Plus TI-86 TI-89 TI-92 Plus

* The TI-82 calculator will remain on the approved list for the 2000–2001 and 2001–2002 school year and will then be deleted from the approved list. These calculators are not recommended for students entering high school mathematics who wish to use a calculator throughout their high school program.

The following calculators meet the graphing calculator criteria and are approved, but are no longer commercially manufactured.

BRANDS	Casio	Sharp	Texas Instruments
MODELS	FX-9700 series CFX-9800G CFX-9850G CFX-9850GA Plus	El-9600 El-9200 El-9300	TI-92

Note: Instructions for clearing calculator memories are posted in the Alberta Learning web site:

http://ednet.edc.gov.ab.ca/studenteval/diplomaexams.

For Further Information

If you have any questions or comments about this policy, please contact Phill Campbell, Assistant Director, Mathematics/Science Unit, Learner Assessment Branch, at 780-427-0010, e-mail: Phill.Campbell@gov.ab.ca, or Fax 780-422-4200. To call toll-free from outside of Edmonton, dial 310-0000.

see also *Calculator Active Questions* and *Clearing Instructions*

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Exam Specs | Exam Design | Assessment | Scoring Guide | Curriculum Standards & Examples |
| Cognitive Levels | Calculator Use | Directing Words

July 2000 - Learner Assessment Branch • Alberta Learning

Mr. Peregoodoff's Classroom Outline

Welcome to my classroom. I hope that while it may not be exactly an enjoyable semester for all of you, at least it is interesting and that you have some measure of success. Here is a list of some of the things you need to know for my classroom.

The Golden Rule

This classroom will be one of equality, safety, mental stimulation and humor. This is not negotiable and infractions will be dealt with the seriousness warranted.

Other Rules of the road

Lates – knowing that things do occur, students are requested to quietly enter the classroom, sign-in on the pink sheet on top of the filing cabinet, and sit at their seats. More than 2 lates in one week will result in spending a lunch hour with me doing homework. More than 4 lates in two weeks will result in Friday prime time being assigned.

Shake da' Brain – This is a weekly question that will be placed on the blackboard. This is not a mandatory exercise but rather a way for students to receive bonus marks. Each correct answer will give the students 1 percent on their report cards, to a maximum of 5 percent per report card. Students may only submit one answer per week.

Handing in work to be marked – At the front of the classroom on the desk, there is a bucket for each of the classes. All work to be marked must be placed in your box and have your name on it. Work with no name will not be marked.

Exams – During the writing of exams student desks must be arranged in traditional rows. All students will be expected to help in this process and also returning the desks to their original pattern. All exams must be written in pencil. Exams written in pen will have a 20% deduction automatically.

The Bear – Fred the teddy bear is there when you need it. Under no circumstances will any foolishness be tolerated in this regard. It must always be returned to the den at the end of class period.

Music – Music is important to me and during work times, music will be played. Students are encouraged to bring the music that they enjoy working to. Students are not allowed to touch the computer unless with permission from me. Individual students are allowed to listen to discman's except during lectures and other activities.

Cartoons – Additions to the wall of fame are welcome, as are stories!

Course Project

As recommended by Alberta Learning, each student will complete a course project. This project will be unique from semester to semester and will assist students in applying some of the concepts that have been learned during the course. It is expected that each student will spend roughly five hours on this project. This page will contain the details of the project as well as some websites that may be of assistance to those students requiring such.

To find out more information about this project, you may move to the Alberta Learning Website

Applied Math 30 Student Project   February 2001   Get Acrobat Reader

Applied Math 30 Student Project   LCI Only   Sample Solutions (MS Excel File)

Applied Mathematics 30

Kayaking the Clayquot Sound, Tofino BC – Student Project

Introduction

A Graduation Kayaking trip is being planned. The trip will be 4 days and 3 nights in length. Your parents have agreed to cover the cost of traveling to Clayquot Sound. You will need to budget $500 for supplies, cost of renting equipment, etc. Ignore any costs associated with traveling to and from Tofino, your departure city. Assume that this project will **only** cover costs and supplies needed from the point that you put into the water, till you take out of the water.

Student Task

1. Budget: Create a spreadsheet that will be used to determine the total cost of supplies as well as the quantity of supplies. You may use this list as a guide or you may go and find your own. You will need to research the cost of renting the kayaks for the period. You may use the Tofino Kayaking Company or find your own.

2. Based on the information provided from last year's grad trip, construct 95% Confidence Intervals for the allowable weight for the kayak. Then, using your packing list and your own weight, determine what percent of students have a **heavier** kayak than yourself.

Graduation Sea Kayak Trip		
July-August 2000		
Student's	Name	Total Departure Weight (Kg's)
	Rob	242.8
	Elaine	186
	George	210.3
	Colleen	193
	Phil	215
	Ahmed	238.4
	Trahn	268
	Ralph	186
	Connie	203
	Jane	199

3. Due to rental demands, your trip must take place on one of the following dates:

      July 1 to July 4

      July 8 to July 11

      July 16 to July 19

      August 4 to August 7

- Using tidal charts and the trip date you have decided upon, create a spreadsheet comparing the height of the tide as a function of time. Use this spreadsheet to determine a regression equation and graph for the time changes of the tide for the trip. Identify the variables as they relate to the

spreadsheet information. (Hint: use a total of 96 hours rather than 4 days of 24 hours for the spreadsheet)

- Does the graph show you anything that the spreadsheet does not? Explain.
- Discuss how the regression equation relates to the spreadsheet.
- Would the regression equation or the spreadsheet be more appropriate for presenting the information?
- Would the regression equation or the spreadsheet be more appropriate for determining the best possible start and end times for each day of kayaking?
- Identify the domain and range of this function in the given context.

- Use this information to determine the best possible start time for each day of kayaking so that you are paddling with the tide and not against it. You may use the following chart to assist you.

Date	High Tide (time)	Low Tide (time)	Location	Best Start Time

4. Use vectors to plot you're the course for each leg of the trip. Campsites are indicated on the map, these are the only possible campsites since you are traveling in a protected area. The tidal current and charts are included in this package.

http://www.for.gov.bc.ca/hfp/rec/maps/svanisle/level1/fullmap.htm
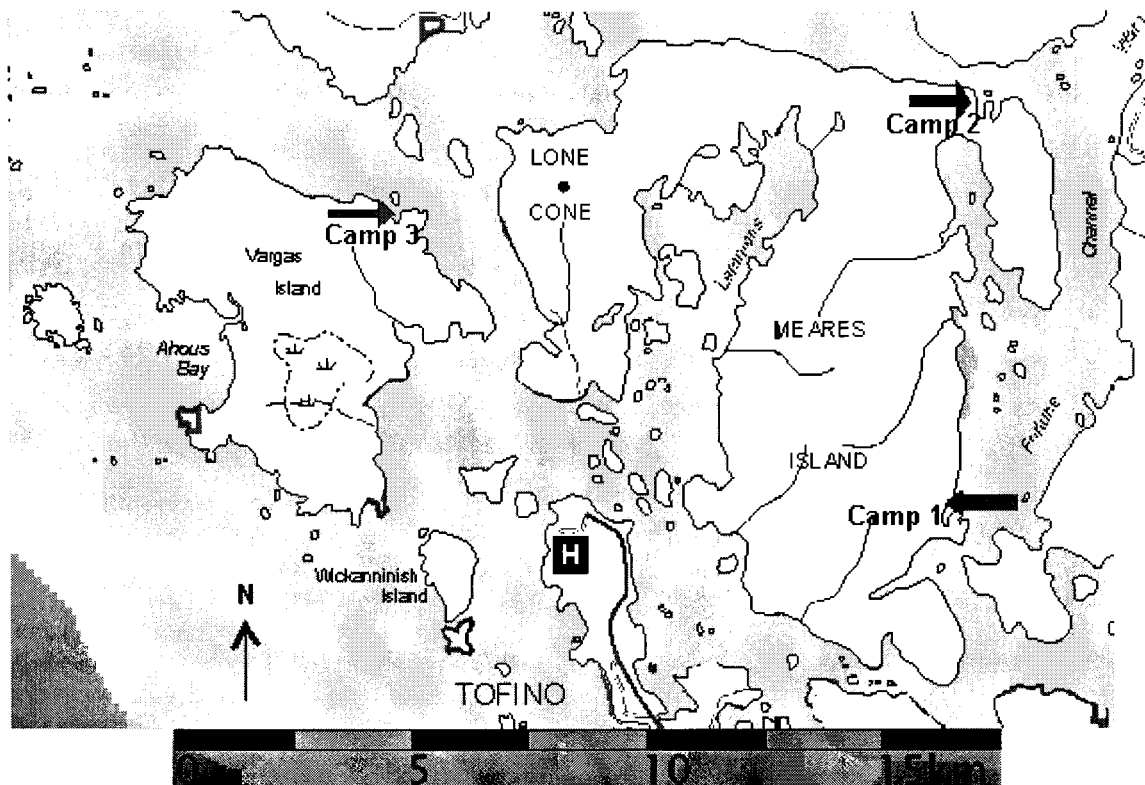
5. Calculate the distance you will travel each day using the vector diagrams as well as your travel time. Assume an average travel time for your group of 5 km/h.

Project Report

Prepare a clear concise report in which you outline each of your findings. Discuss factors that influenced your choices.

Project Report

Your report should include most, if not all, of the following elements.

1. Title Page

- The exact title of the project
- The Mathematics course number
- The date of submission
- Your name(s) and your teacher's name

1. Main Text

- A clear statement of the topic
- An accurate and detailed account of the processes used in the project, including any unique equipment, scientific procedure details, mathematical calculations, data, and graphs. If a group conducted the project, the roles of individual students should be documented.

3. Summary Section

- Project conclusions that summarize or bring together the ideas you have been investigating.
- A statement regarding the limitations of the project and a summary of possible further investigations that could be done as a result of this project.
- A brief summary of the mathematical knowledge encountered during the investigation and a statement of the areas of study from which it was drawn; eg. statistics, trigonometry, vectors. An indication, if appropriate, should also be given of how computers or graphing calculators were used.

4. Acknowledgements

In this section, acknowledge the assistance provided by librarians, student partners, specialist information sources, family, teachers and other sources.

5. References (if necessary)

Any references actually consulted and found to be useful should be included and cited.

6. Appendices (if necessary)

Include necessary lengthy calculations, original computer programs (listing and out put), raw data, or other essential resources. Title each appendix and number them consecutively.

Sea Kayak Needs	Price	Weight (K
Totals	478.2	110.09
Kayak (single or double with seat)	171.2	Not includ
Paddle with drip rings	Included	2
Spray skirt (two if paddling a double)	Included	3
Collapsible spare paddle	Included	2
Sponge	Included	0.3
Waterproof storage bags	Included	3
Waterproof deck bag for storing essentials	Included	1
Personal Floatation Device (Coast Guard Approved!)	Included	2

Safety Essentials

	Price	Weight
Sunglasses	20	0.05
Water bottle or hydration system such as Camelbak, Ultimate	2	0.3
Nylon cord (50 feet) for tying up food from predators	3	0.25
Waterproof/windproof matches	2	0.005
Headlamp (extra bulb and batteries)	35	0.5
Pocket knife	10	0.15
Toilet paper	2	0.2
Navigation charts	20	0.35
Compass	15	0.02
Emergency blanket	3	0.09
Whistle	0.5	0.005
Signal mirror and flares	1	0.3
Emergency snacks	4	1
Sun hat	10	0.4
Repair kit (tape, material to patch hull, pliers, nuts and bolts to fit boat parts)	3	0.8
AM/FM hand radio for weather reports	10	0.25
Current tide tables	included	0.005
Waterproof watch	40	0.005

First Aid (all of this material will be supplied by guide but it is good to look at)

Antibiotics	Included	Not Applic
Antiseptics	Included	Not Applic
Tylenol	Included	Not Applic
Benadryl	Included	Not Applic
Tincture of Benzoin	Included	Not Applic
Sterile gauze pads	Included	Not Applic
Roller gauze	Included	Not Applic
Nonadherent dressing	Included	Not Applic
One-inch adhesive tape	Included	Not Applic
Steristrips	Included	Not Applic
Ace wrap	Included	Not Applic
Large compress	Included	Not Applic
Moleskin	Included	Not Applic
Second Skin	Included	Not Applic
Tweezers	Included	Not Applic

Bandage scissors	Included	Not Applic
Irrigation syringe	Included	Not Applic
Low-reading thermometer	Included	Not Applic
SAM splint	Included	Not Applic
Space blanket	Included	Not Applic
Pencil and emergency report form	Included	Not Applic
Emergency Phone Numbers and money for a phone call	Included	Not Applic

Clothing

Paddling jacket	owned	2
Long underwear (lightweight tops and bottoms. Synthetic is best or wool / synthetic/cotton blend)	owned	0.7
Paddling shorts	owned	0.5
Bathing suit	owned	0.3
Insulated hat	owned	0.2
Fleece or Polartec jacket	owned	2
Croakies or Chums for glasses and sunglasses	owned	0.05
Rain suit (jacket and pants)	owned	2.5
Warm gloves for around camp	owned	0.4
Chamois towel	owned	0.01
Paddling shoes or wet suit booties	owned	0.5
Camp / hiking shoes or all-terrain sandals	owned	0.7
Socks for around camp	owned	0.3

Personal

Quick drying towel	owned	0.5
Biodegradable soap and shampoo	owned	0.3
Toothbrush and toothpaste	owned	0.1
Hair brush	owned	0.1
Personal medications	owned	0.5
Feminine hygiene	owned	0.5
Lip balm	owned	0.05
Compact mirror	owned	0.2

Camping Gear

Compact tent with rainfly	owned	4.5
Sleeping bag and pad	owned	5
Backpacking stove and fuel (butane is typically the most compact and easiest to use)	owned	4
Cooking pot	owned	2
Cup, plate and eating utensils	owned	1
Bag for hanging food	owned	0.4

Miscellaneous

Binoculars	owned	0.7

Multi-tool knife	owned	0.6
Fishing gear and license	20	4
Mini flashlight	10	0.8
Extra heavy duty garbage bags	6	1
Camera and film in waterproof bag or container	owned	1
Sunscreen	4.5	0.5
Insect repellent	6	0.5
Daypack for side trips out of boat	24	1
Crazy Creek chair or kit to convert ThermaRest pad into chair	owned	3
Bird / sea life guidbooks	owned	5
Sewing kit	owned	0.5
Bandana	owned	0.2
Snorkel and mask	owned	1
Zip-Lock bags	owned	0.3
Moisturizing lotion	2	0.7

Food

Day one (depending on departure time, ie. Afternoon tides won't require a breakfast or lunch

Water	0	30
Breakfast		
Lunch	6	1
Dinner	8	2

Day two

Breakfast	4	1
Lunch	6	1
Dinner	8	2

Day Three

Breakfast	4	1
Lunch	6	1
Dinner	8	2

Day Four (again this will depend on tides as to the time of day to return)

Breakfast	4	1
Lunch	6	1
Dinner		

5)

ed in packing weight

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Graduation Sea Kayak Trip
July-August 2000

Student's Name	Total Departure Weight (Kg's)
Rob	232.8
Elaine	165
George	210.3
Colleen	193
Phil	215
Ahmed	208.4
Trahn	224
Ralph	186
Connie	178
Jane	188

Average	200.05
Deviation	21.47728775
95% Confidence Interval	
Upper Bound	242.145484
Lower Bound	157.954516
Total Weight (gear plus paddler)	205.09
Z-score	0.23
Percentage from table	59.10%
Percentage of students who have a heavier kayak	40.90%

Time (24-hour)	Tide Height
333	0.7
947	2.7
1518	1.4
2130	3.4
2826	0.6
3446	2.8
4011	1.5
4617	3.4
5313	0.5
5936	2.9
6459	1.5
7100	3.4
7755	0.4
8422	2.9
8944	1.6
9541	3.4

Tidal Chart regression for July 1 to July 4, 2001

Excel Chart

Tide Height
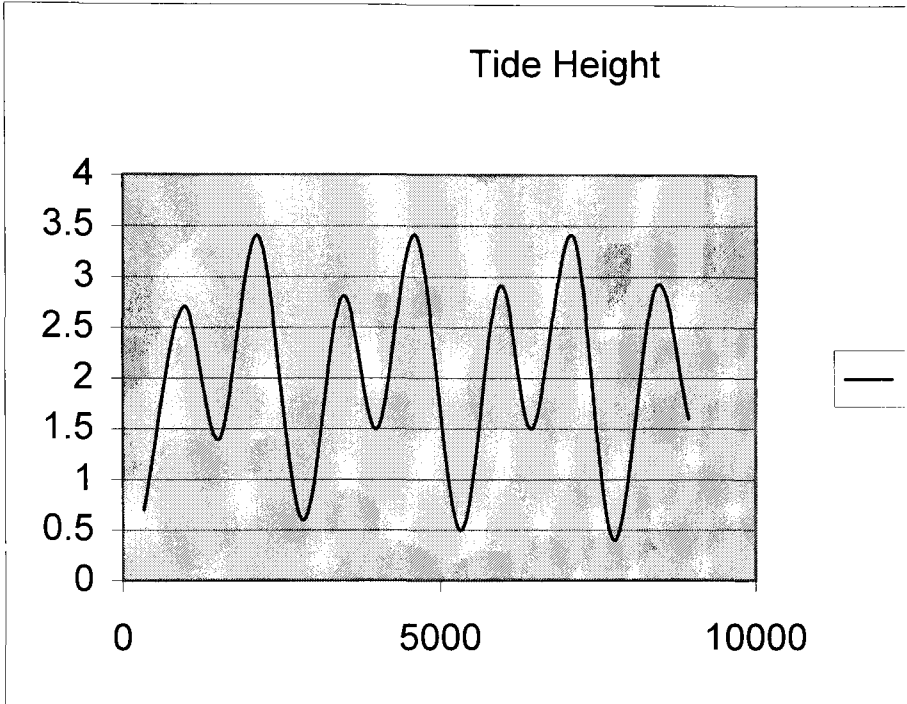
Example TI-83 Windows for the Sinusodial Regression
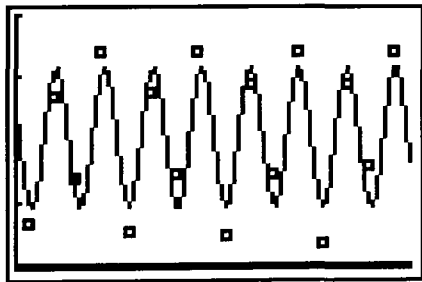

```
SinReg
 y=a*sin(bx+c)+d
 a=1.115885293
 b=.005112363
 c=2.641187894
 d=2.06900333
■
```

Questions

The graph gives us a visual representation of the spreadsheet that cannot be se
The regression equation is the algebraic representation of the tidal flows
The equation would be more accurate
Domain first day of trip to last day of trip
Range 0.4 to 3.4 meters tide height

Date	High Tide	Low Tide	Location	Best Start Time

Jul-01	3.2	0.95 Tofino	1600	All of these times are
Jul-02	3.2	0.95 Camp 1	1100	the friendly tide, either
Jul-03	3.2	0.95 Camp 2	1200	case may be.
Jul-04	3.2	0.95 Camp 3	700	

Vector and time calculations

http://www.for.gov.bc.ca/hfp/rec/maps/svanisle/level1/fullmap.htm
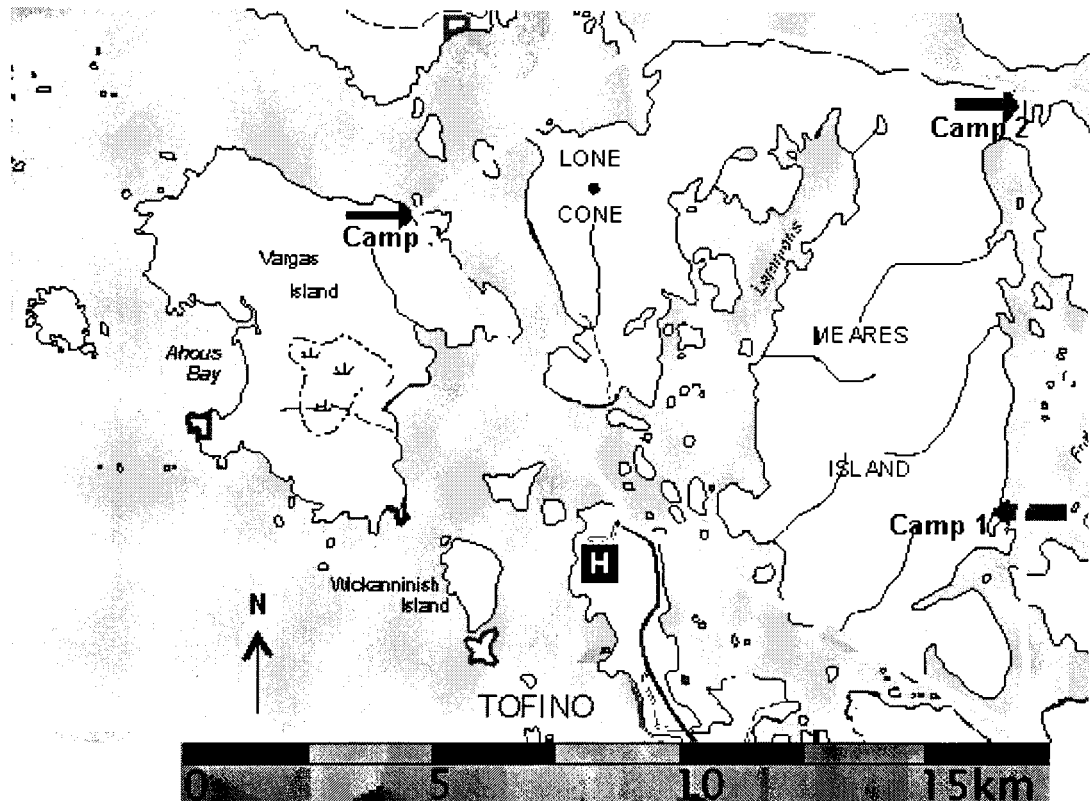
Start	Finish	Distance kms	Direction	Time hours
H (Tofino)	A	8	$E20^0S$	1.6
A	Camp 1	4	Due North	0.8
Camp 1	B	8	$N20^0E$	1.6
B	Camp 2	2.75	Due West	0.55
Camp 2	C	7.75	$E15^0N$	1.55
C	Camp 3	6.5	$E35^0S$	1.3
Camp 3	H (Tofino)	7.5	$E53^0S$	1.5
			Total Paddling Time	8.9

— Tide Height
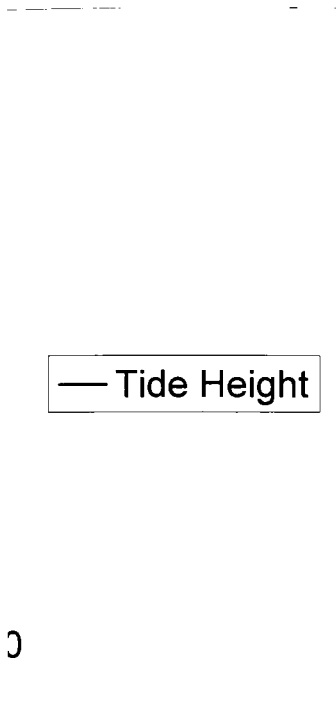
en easily from the data

neant to "ride"
in or out as the

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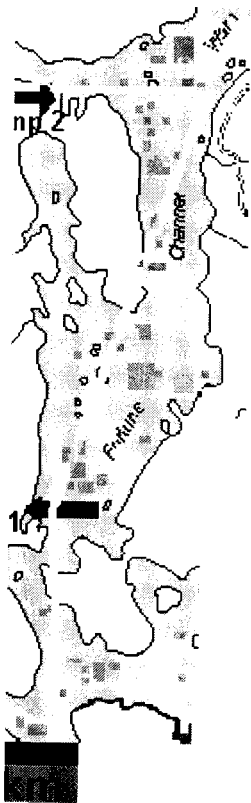
Probability

Click here to go to the Activities Page

Objective	Powerpoint Presentation	Extra Questions	Relevant Websites
1.1 Experimental vs. Theoretical Probability	What is the difference between Experimental and Theoretical Probability?	Multiple Choice Questions	Probability Help
1.2 Generating and using sample spaces	What is a sample space and how do I generate one?		Same as above
1.3 The Fundamental Counting Principle	What is the Fundamental Counting Principle?	Multiple Choice Questions	Help with the FCP
1.4 Independent and Dependent Events	How can I tell the difference between independent and dependent events?		Same as first one
1.5 Mutually Exclusive Events			Same as first one

APPLIED MATH 30 EXERCISES AND JOURNAL QUESTIONS

UNIT Probabilities   Return to the Probability main page

1.1	1.2	1.3	1.4	1.5	Review
Page 9	17	25	34	42	48
5	1 6	1		5 6	1 -
7	8	2	7	8	
9	9	1 3	4	9	
		8 9			
		10			

Note that there may be changes to these assignments during the unit

---

1.1 Describe briefly the difference between theoretical and experimental probabilities using examples to support your statements

1.2 A friend tells you that a tree diagram can be used to create the sample space for any experiment, but a table or grid cannot. Is this true? Use examples to explain your response.

1.3 Using the fundamental counting principle, determine the number of different outfits you have in your closet

1.4 Write a short paragraph to explain the difference between dependent and independent events in your own words
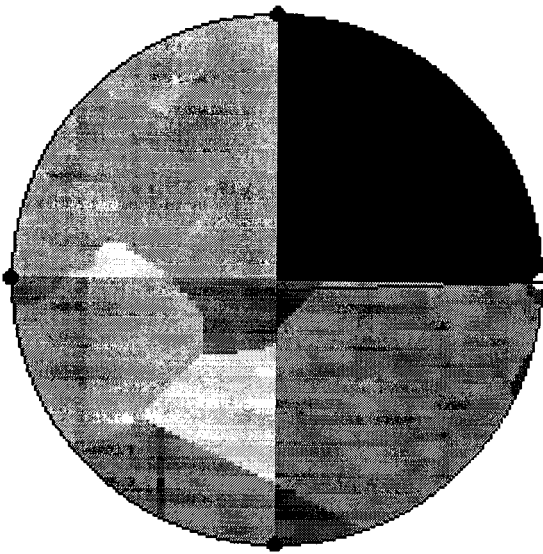
1.5 Write to explain what is meant when two events are mutually exclusive and how the probabilities are affected when two events are not mutually exclusive

The Virtual Spinner

Below you see a virtual spinner that we can use to help us through an activity that will hopefully give us an excellent understanding of what we need to learn in the Probabilities Unit.

To learn how to adjust the spinner and what all the buttons do, click here

Click here for the activity sheet, then print it off so that we can write directly on the sheet. Yep, we do get to use pencil and paper occasionally in this world :)

The pointer is on Blue

Number of Sections: 4   +1
                        -1

How many spins?

Spins So Far: 0

| Spin | New Experiment | Show Results Frame | Update |

Blue	◄ [ ] ►	25 0	%
Cyan	◄ [ ] ►	25 0	%
Green	◄ [ ] ►	25 0	%
Magenta	◄ [ ] ►	25 0	%
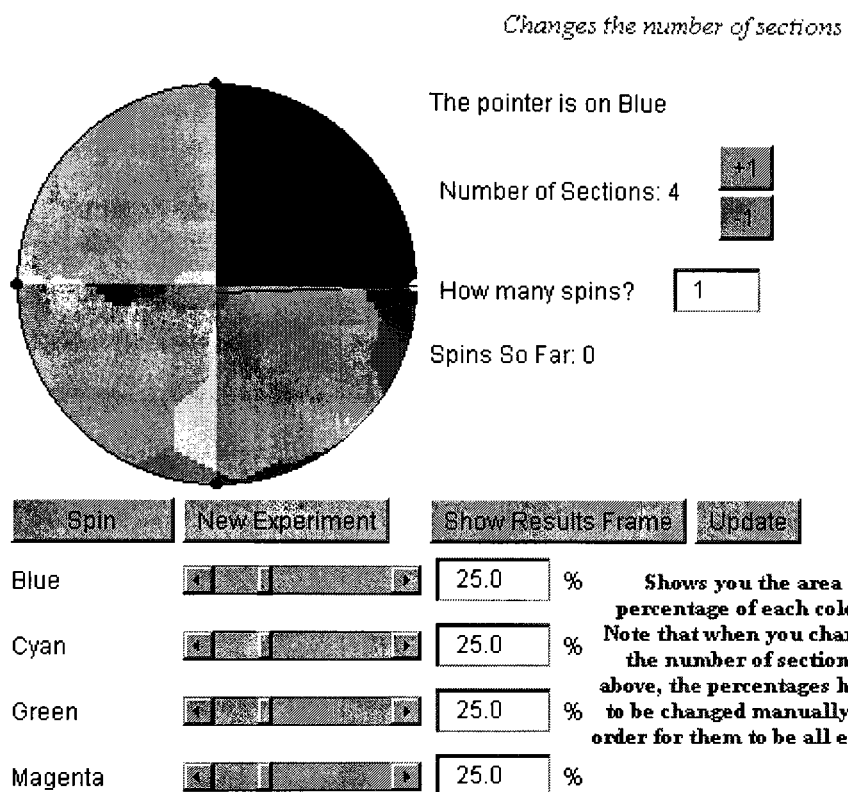
Spinner

By default, the spinner will always be 4 sections when you first open it up.

Changes the number of sections

The pointer is on Blue

You can adjust the number of spins that each spin will represent. This allows you to simulate a much larger experimental set of data

Number of Sections: 4   **+1**

-1

How many spins?   `1`

Press the spin button for each event, the new experiment will reset all of your values

Spins So Far: 0

The Show Results Frame button will bring up a second window which will give you a visual picture of the results of your data, as shown in the table below the spinner

| **Spin** | **New Experiment** | **Show Results Frame** | **Update** |

Blue	[◄ ▐ ►]	25.0	%
Cyan	[◄ ▐ ►]	25.0	%
Green	[◄ ▐ ►]	25.0	%
Magenta	[◄ ▐ ►]	25.0	%

Shows you the area percentage of each color Note that when you change the number of sections above, the percentages have to be changed manually in order for them to be all equal

The percentage of each color can be changed automatically in the window, or manually by moving the sliders

RETURN TO SPINNER PAGE

SPINNER ACTIVITY SHEET

1. With the spinner program running on your computer in front of you (note: you may wish to minimize your toolbars so that you can see the whole spinner at the same time), change the spinner to only have 3 sections instead of the default four.
2. Make sure that you adjust the percentages of the area of each color. What should each color be if they are all to be equal?
3. On a separate piece of paper, create a table with the appropriate sample space for each of the different number of spins. Click here if you would like a refresher on this topic. Don't be afraid to sketch out a tree diagram if you need assistance.
4. For one spin -Answer
5. For two spin -Answer
6. You may check your answers , but you will have to enter the correct size (n) of each sample space to see the answers.

1 Spin Sample Space
blue
cyan
green

The sample space is above, the n-value is 3 because there are 3 possible outcomes

return

2 Spin Sample Space
blue green
blue cyan
blue blue
green blue
green cyan
green green
cyan blue
cyan green
cyan cyan

The sample space is above, the n-value is 9 because there are 9 possible outcomes

return

Experimental vs. Theoretical Probability

29/03/01

Click here to start

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Author: Robert James Peregoodoff

Email: rob.peregoodoff@lethsd.ab.ca

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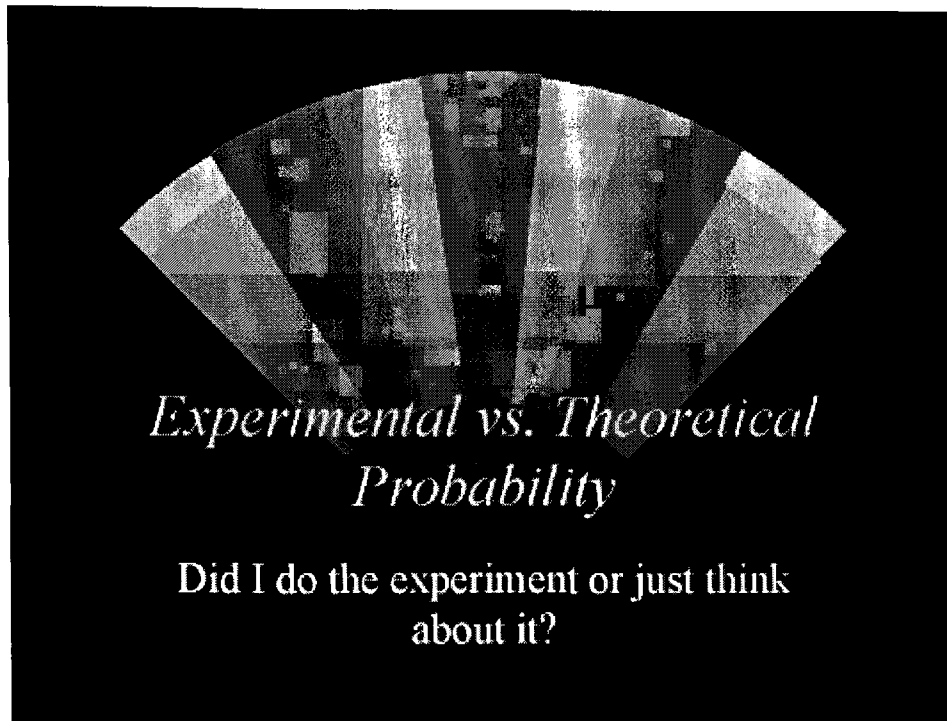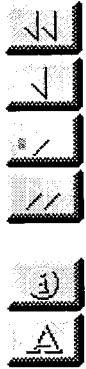
Slide 1 of 6
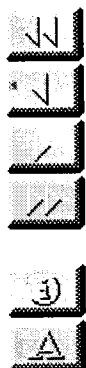
A comparison

- Experimental probability refers to actually performing the event that we wish to study

- While Theoretical is exactly what the name implies; we are going to think about what the probabilities are
- Let's take a look at an example

Slide 2 of 6
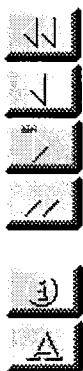
- So pull a quarter out of your pocket. it's okay, I'll wait..........ok good, now flip it 10 times and count the number of heads that you got.
- So we all know that the probability of getting one head is 0.5 or 50% but did you get exactly 5 heads out of your 10 tosses?
- My bet is that you didn't, more likely you got 4 or 6 or even 7.
  - While the theoretical probability may be 50%, the experimental is not always exactly the same.

Slide 3 of 6

Guess What?

▸ That's why people gamble !!!!!!!
What we think is going to happen isn't
what always happens........

▸ Now here's a question for you:

  • What should happen to the experimental
    probability, in relation to the theoretical,
    the more times that we perform the
    experiment?

Slide 4 of 6

Slide 5 of 6

Slide 6 of 6

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PROBABILITY

Each of our 54 lessons is a comprehensive learning module. This Volume consists of 10 lessons, and a solutions page. Read our Terms and Conditions under which these lessons are provided to you. If you are using our lessons for the first time, you also need to read this important technical information.

Lesson	Learning Objectives
Introduction to Probability	To define experiment, outcome, event, and probability. To understand the formula for finding the probability of an event. To find the probabilities of simple events with equally likely and with non-equally likely outcomes. Interactive spinners and dice are included.
Certain and Impossible Events	To define certain and impossible events. To identify events as certain or impossible, and to compute the probabilities of these events.
Sample Spaces	To define the sample space of an experiment. To determine the sample space of an experiment by examining each possible outcome.
The Complement of an Event	To define the complement of an event. To find the probability of the complement of an event.
Mutually Exclusive Events	To understand the difference between mutually exclusive and non-mutually exclusive events. Venn diagrams are used to make this distinction clear. To classify an experiment as having mutually exclusive or non-mutually exclusive events.
Addition Rules for Probability	To find the probability of mutually exclusive events by using the addition rule.
Independent Events	To define and understand independent events. To use the multiplication rule to find the probability of independent events.
Dependent Events	To define and understand dependent events. To use a modified version of the multiplication rule to find the probability of dependent events.
Conditional Probability	To define conditional probability. To understand the formula for finding conditional probabilities. To compute the probabilities of conditional events.
Challenge Exercises	To solve 10 additional problems that challenge students'

Challenge Exercises	To solve 10 additional problems that challenge students' understanding of probability. To review concepts learned and to assess students' understanding.
Solutions	Complete solutions to all exercises presented in each lesson of this Volume. Includes the problem, solution, and answer for each exercise.

Click here for the Math Goodies CD-ROM!
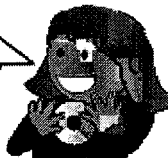
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Last Modified
10 May 2001

Calculating Probabilities

1. The theoretical probability of rolling an even number with one die, reduced to it's simplest form, is
a) P(even) = 1/6
b) P(even) = 3/6
c) P(even) = 1/2
d) P(even) = 5/6

2. The outcome that is seen from performing an experiment would be called the:
a) Theoretical probability
b) Experimental probability
c) Complement
d) Statistical probability

3. One card is drawn from a well-shuffled deck of 52 playing cards. The probability of drawing a red card, in reduced form, is
a) P(red card) = 13/52
b) P(red card) = 26/52
c) P(red card) = 1/52
d) P(red card) = 1/2

----------Key----------

1.
2.
3.

Sample Spaces

29/03/01

Click here to start

Table of Contents

Sample Spaces

What is the Sample Space?

Lets look at an example

Now you try one

Just remember that when you are asked for a
sample space,

Author: Robert James Peregoodoff

Email: rob.peregoodoff@lethsd.ab.ca

return to Probability Main Page
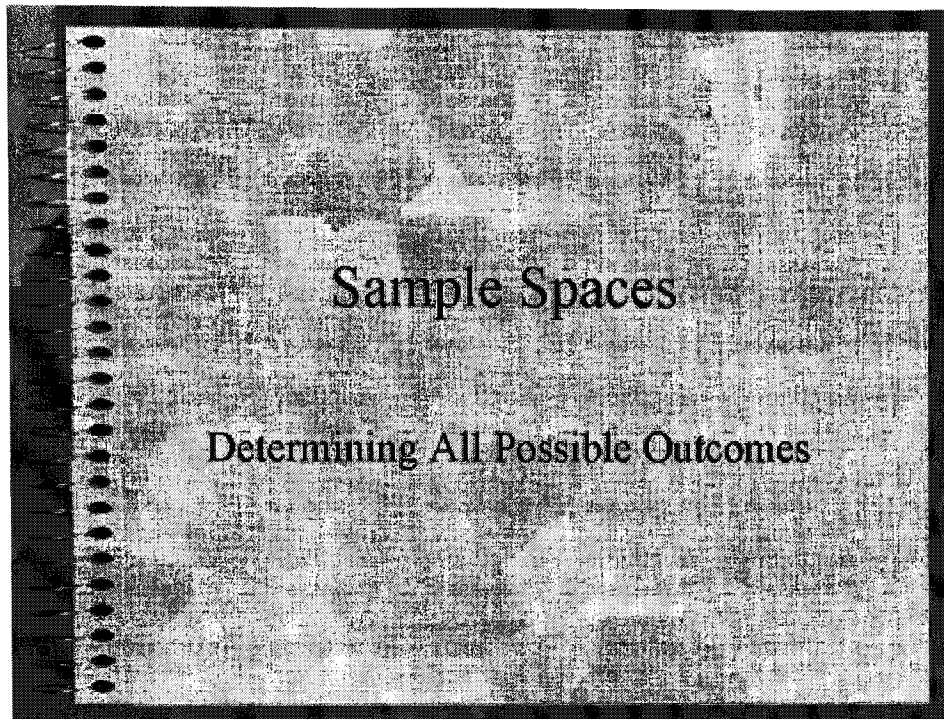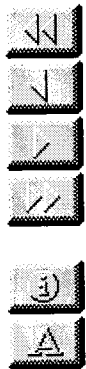
Slide 1 of 5

What is the Sample Space?

- Simply put, the sample space is the LIST of all the possible outcomes of an experiment (theoretical OR experimental!)
- In the previous section, we learned that probabilities are calculated using $P(A) = \dfrac{r}{n}$
- Calculating the n value can be difficult, but may be easier if we can visualize the sample space for the experiment.

Slide 2 of 5

Lets look at an example
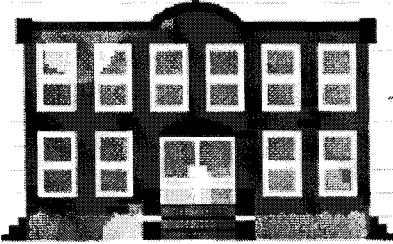
- If you were asked to list the sample space for the experiment of rolling one die, what would it be?
- Answer {1,2,3,4,5,6}
- The actual value of n will be 6, but the sample space is all of the above items
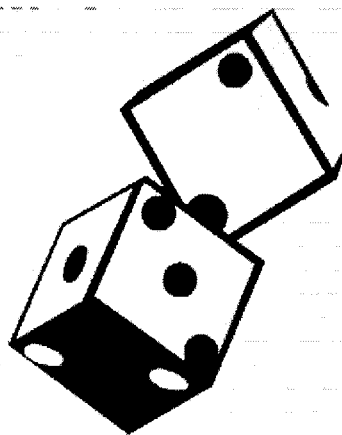
Slide 3 of 5
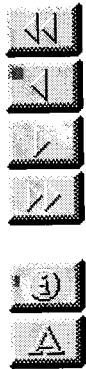
Now you try one

- What is the sample space of grades in a high school?
- Yep. it would be {10, 11, 12}, giving us an n value of 3.

Slide 4 of 5
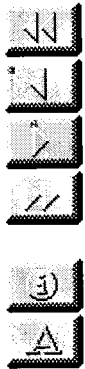
Just remember that when you are asked for a sample space,

You are being asked to LIST all of the possible outcomes of the given experiment

What about the sample space for rolling two dice? The n value will be 36, try and find them all ✹

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Fundamental Counting Principle

25/03/01

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Fundamental Counting Principle

Definition of the FCP

What does this mean for us?

Example of FCP

Now let's try one

Seems simple enough eh? Well let's throw in
the wrinkle, restrictions!

The simple way to handle this is to set up the
spaces that we would use

So that is the FCP

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Fundamental Counting Principle

The lazy way to determine the values of r and n.

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Definition of the FCP

- ## The fundamental counting principle (FCP) is defined as:

  - If one item can be selected in m different ways and a second item can be selected in n different ways , then the two items can be selected in $m \times n$ ways. This same principle works for 3 or 4 or even 23 items!

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What does this mean for us?

- Very simply, the FCP will allow us to determine the number of possible (or favorable) outcomes **WITHOUT** having to actually determine the entire sample space. Let's look at an example.

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Example of FCP

- A hockey coach has the following players on her team:
  - 6 forwards
  - 5 defence
  - 2 goal tenders
- The question is
  - How many different lines can this coach put on the ice?

- Now we could design a very elaborate tree diagram to visualize this situation but we are too lazy for this!!
- The FCP tells us that
  - $6 \times 5 \times 2 = 60$
- In other words, the coach has 60 different lines that can be played.

Slide 4 of 8

Now let's try one

- The lock on your locker uses the numbers from 0 to 59. How many different lock combinations are there?
  - Hint: there are 60 numbers to use!
  - Click to see the answer

- We could draw a tree diagram for this but Wow, way too much work. Let's be lazy and use the FCP. This gives us:
  - 60x60x60 or 60^3 which equals 216000 different possible combinations for your lock

Slide 5 of 8

Seems simple enough eh? Well let's throw in the wrinkle, restrictions!

- What if there are numbers that cannot be used?   One example that is common are postal codes.

- Here in Alberta, all of our postal codes must begin with the letter T, so how many different codes are there?

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So that is the FCP

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- In the next set of slides, we will learn how this can be used to calculate probabilities of very complex events.

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Fundamental Counting Principle (FCP)

1. The number of ways that a person can dress if they have 6 shirts, 3 sweaters and 4 pairs of slacks is:
a) 72
b) 18
c) 13
d) 12

2. Using the digits 1, 4, 6, 8, and 9, how many 2 digit numbers can be formed?
a) 100
b) 10
c) 25
d) 28

3. A person must choose 1 card from a well-shuffled deck of 52 playing cards, then roll a six-sided die, and finally toss a coin. How many different results are possible?
a) 624
b) 312
c) 104
d) 52

4. Using the digits 2, 3, 5, 6, 8, and 9, how many three digit numbers can be formed if no digit can be repeated?
a) 120
b) 218
c) 60
d) 16

5. How many different phone numbers are possible if the number must start with 317 because it is a certain cell phone company?
a) 10,000
b) 40
c) 10^7
d) 10^4

6. Given the following digits: 2, 3, 5, 7, and 8, what is the probability that you will randomly create a 2 digit number that is odd?
a) P(2digit odd number)= 3/5
b) P(2digit odd number)= .6
c) P(2digit odd number)= 20/25
d) P(2digit odd number)= .4

----------Key----------

1. (a)
2. (c)
3. (a)
4. (a)
5. (a) (d)
6. (a) (b)

Are you an Independent Person

28/05/01

Click here to start

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Are you an Independent Person

What is the difference between an
Independent and a Dependent Event?

Slide 1 of 9

When is this important

✓ The first key point to understand in this section is that we are dealing with calculating the probabilities of more than one event occurring here.

✓ An example of this would be what is the probability of you graduating from high school AND getting married.

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✓ We can determine if two (or more) events are independent if they pass the following test of logic?

— Does the outcome of the first event effect the outcome of the second event?

✓ It seems like a simple question but let's look at some examples

Slide 3 of 9

✓ If you pull out a quarter from your pocket and flip it in the air, then select one card from a well-shuffled deck, are these events independent of each other?

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✓Of course they are. Whether or not you get a head or a tail on the coin makes no difference on what card is drawn from the deck.

✓Let's try some more. On the next slide you will see two columns of events. You decide if they are Independent or Dependent.

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✓ Graduating from high school

✓ Going to University

✓ playing basketball

✓ learning to fish

✓ your parents having blue eyes

✓ you having blue eyes

✓ toss a head with a coin

✓ rolling a 6 with one die

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The Answers

- ✓ Dependent, no chance of going to Uni without a high school diploma
- ✓ Independent events
- ✓ Dependent, naturally you inherit your parent's genes
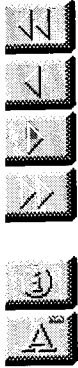- ✓ Independent, one does not affect the other

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What is really important here

✓ In this course, a key term to watch for is "with replacement" or "without replacement"

✓ The most common example of this is pulling colored balls from a bag. Let's say there are 4 blue balls, 6 red ones, and 3 white balls in a bag. We must assume that all the balls are the same size.

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✓ That gives us 13 balls all together in the bag. If we were asked the probability of drawing one red ball out of the bag, putting it aside, and then drawing a second ball out of the bag, these two events would be DEPENDENT. This is because if we don't put the first ball back (without replacement) then the outcome of the second draw is going to depend on what we draw first!

✓ Clear as mud, eh? Hope you understand but I guess it depends doesn't it :)

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Statistics

Click here to see the Power-point® presentation that will review and introduce this unit.

Objective	Power-point Presentation	Extra Questions	Relevant Websites
3.1 Distributions	What is a Probability Distribution?	Multiple Choice Questions	Probability Distribution Help
3.2 Mean and Standard Deviation	The two methods of calculating Mean and Standard Deviation		
3.3 Normal Distributions	The Normal Distribution Graph		
3.4 Standard Normal Distributions	What does it mean to Standardize a score?		Java help calculating Z-scores *(excellent)*
3.6 Confidence Intervals	Calculating a 95% confidence interval		What is a Confidence Interval?

Chapter Review Quiz

Other Websites that might be interesting for the Probability Unit

- Probability Puzzles

APPLIED MATH 30 EXERCISE AND JOURNAL QUESTIONS

UNIT: *Statistics*   **Return to Stats Main Page**

HOMEWORK ASSIGNMENTS

3.1	3.2	3.2	3.4	3.6	
Page 106	114		130	46	52
1 – 5	1 – 6	1 – 5			2
7	8	5 – 9			
8					

* Note that there may be changes to these assignments during the unit

JOURNAL QUESTIONS

1. Create a chart that compares uniform, binomial and normal distributions, outlining the similarities and differences
2. Describe in your own words what Standard Deviation is and how it can be a valuable measure.
3. What is meant by Normal Distribution?
4. What is the advantage of calculating the z-score of different sets of data?

6. Explain what is meant by the term confidence interval in your words?

Statistics

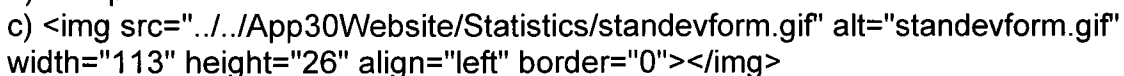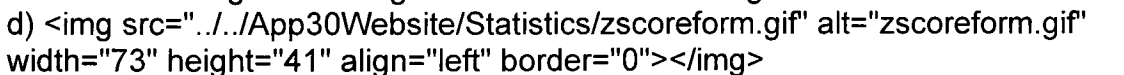1. Standard deviation can also be called:
a) Median
b) Mode
c) Mean
d) Dispersion

2. The measures of central tendency are
a) Mean
b) Median
c) Mode
d) Standard Deviation

3. Standard deviation can be used in which of the following situations
a) Air-traffic control
b) ball-bearing manufacturing
c) provincial elections
d) all of the above

4. Which of the following formulas is used to calculate the average if you are given the number of trials (n), along with the probability (p) of your intended outcome
a) =n x p
b) =1 - p
c) <img src="../../App30Website/Statistics/standevform.gif" alt="standevform.gif" width="113" height="26" align="left" border="0"></img>
d) <img src="../../App30Website/Statistics/zscoreform.gif" alt="zscoreform.gif" width="73" height="41" align="left" border="0"></img>

5. Given the following set of data, the mean and standard deviation respectively would be: (hint:use your calculator)
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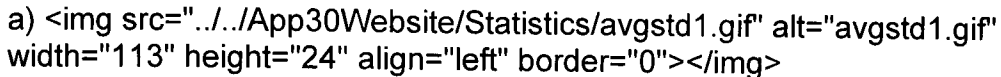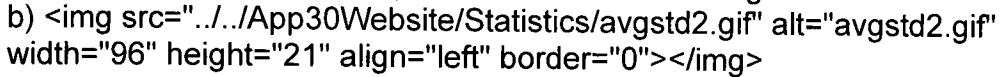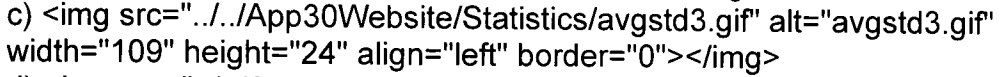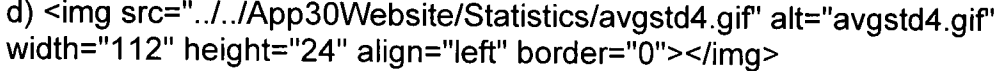<tr>
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6. The following expenditures for food were recorded over an 8-week period:
113, 89, 125, 107, 93, 124, 130, 109

What is the arithmetic mean of these amounts?
a) $13.95
b) $890.00
c) $111.00
d) $111.25

7. The standard deviation (correct to two decimal places) of the population shown below is:

61, 59, 62, 60, 60, 58, 63, 60, 61, 61, 56, 59
a) 1.78
b) 1.77
c) 1.86
d) 2.05

8. The marks on an examination were normally distributed with a mean of 54% and a standard deviation of 8%. The teacher decided to raise the average to 64% by adding 10% to each of the student's score. The new standard deviation will be:
a) 18%
b) 54%
c) 5%
d) 8%
```

9. What percentage of the area under the standard normal curve lies between z-scores of -1.8 and 0.7? (hint: you are going to have to do more than just read the numbers off of the chart, draw a diagram to help you visualize the area needed)
a) 72.21%
b) 79.39%
c) 3.59%
d) 75.80%

10. A brush manufacturer determines the mean life of his brushes to be five years, with a standard deviation of two years.  If he guarantees this brushes for three years, the percentage of brushes (rounded to the nearest whole)  that he should expect to replace under warranty are:
a) 60%
b) 84%
c) 16%
d) 2%

11. The heights of 1500 students at a local high school were determined and the results analyzed.  If the heights were normally distributed about a mean of 165 cm and a standard deviation of 12 cm , the number of students who are taller than 180 cm is:
a) 158
b) 1341
c) 1200
d) 300

12. On a university entrance exam, the mean of all the scores was 53 and the deviation was 5.2. If Sue's score on the test was 65, what was her Z-score?
a) 2.3
b) -2.3
c) 12.0
d) 98.93


----------Key----------

1. (d)
2. (a) (b) (c)
3. (d)
4. (a)
5. (a)
6. (d)
7. (a)
8. (d)
9. (a)

10. (c)
11. (a)
12. (a)

Statistics

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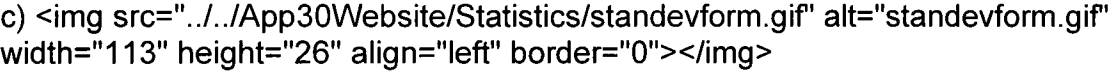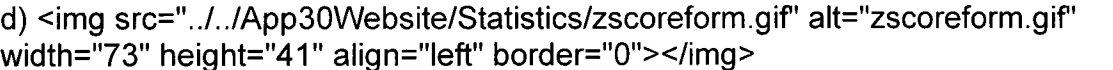<td>22</td>
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9. (a)

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12. (a)