The Log of Logs,
Mathematics Student Portfolio

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Measure in dynamic systems

- 1905 Einstein: time-space continuum

  Attempts to separate place from time have always distorted interpretations of reality, and always will.

- 1927 Heisenberg: uncertainty theorems

  The more closely a measure informs us about position, the more it obfuscates trajectory, and vice versa.

- 1931 Gödel: incompleteness theorems

  No set of axioms can fully explain a non-trivial system; there will always arise a truth that the system can not prove or predict.

Education is a dynamic system

- 2007 Baker, (expanding upon AMATYC and NCTM standards)

Laws of the universe hold for people too!

Educational needs do depend on both our time and place in history.

Traditional pedagogy assumed position equals trajectory, so has obfuscated modern learning, and left students uncertain ...

Modern attempts to axiomatize learning and to make tests all-and-everything, ignore diversity and reduce formal education to a trivial pursuit. Society has begun to treat it so.

Population Explosion

Technology Revolution

Information Rage

Increased DENSITY

So many things
to keep track of .

So many different ways to
keep track of them.

How stuff works:

Through≈1970: Mechanical, sensory:
Could tinker and “figure it out”

In 2000: Electronic, abstract, symbolic:
Must “read and follow the instructions.”

Reasonable sometimes. Reducible to algorithm often. But not sensible…

The new “ Black Box” world
is not accessible
to the un-trained, to the un-equipped.

Employer Pressure:
desired of employees with degrees

U. Alaska president's informal study:

Read and explain technical information

AMATYC and Georgia Transportation Department

Show up everyday

Learn from mistakes

"Math for All"

The 10% talented in mathematics/logic, assured us by the normal curve, are no longer enough to meet the needs of modern society…

"Open enrollment" College

-- the "other 90% need mathematics

--everyone required to study algebra

The traditional approach no longer prepares enough students with necessary math skills!

Too many “good students” opt out of
mathematics and science
as soon as the opportunity presents itself.
Why?

The Second Tier

Sheila Tobias’ construct

The most significant contributing factors are the **lack of**:

1) Opportunity to develop facility
with the language of the content
2) opportunity to develop facility
with the “language” of human interaction
3) Shared success, and the strength of spirit of it engenders.

Crossroads Corner

March 2007 *AMATYC News*

"Why adopt mathematics standards?...

- Increase quantitative literacy of all students
- Develop students ability to communicate mathematically."

UAS Catalog

"Student Outcome Goals

...Assignments and tasks will be embedded into the course objectives of many different courses at different level of the curricula to provide students the opportunity to learn and demonstrate mastery of these competencies:

Communication:

…write, speak, read, and listen effectively for a variety of purposes…

Quantitative Skills:

…analytic and mathematical reasoning.. and quantitative problems…

Information Literacy:

…Identify…locate…analyze and evaluate…integrate and communicate…evaluate information (as well as) product and process.

Computer Usage:

…skills range from basic abilities, to telecommunications….and electronic mail technologies.

UAS Catalog Cont.

Professional Behavior:

…is expected of college students…including responsibility, good work habits, ethical decision making, ….and successful human relations.

Critical Thinking :

… approach from multiple perspective…compare and contrast ideas and models, and willingness to take intellectual risks.

Students' skills in these six areas will be assessed periodically during their studies at UAS"

Syllabus for Math 107– College Algebra (4credits)…

Your grade for this class will be determined by **your performance** across the four modes of assessment described below:

Preparation and Participation	12%
Tests and Quizzes	64%
Email writing assignment	12%
Portfolio	12%

*Note: Each component of this grading rubric is worth at least one full letter grade.

*Note: this grade does not include a component for "student's innate abilities." Only student performance, as described above, is considered in the final determination of the course grade.

Log of Logs : a portfolio

Funk and Wagnall's defines a "log" as

a "record of the progress of an undertaking--usually technical in nature."

Learning mathematics
is an extended undertaking;
it is technical in nature.

There are diverse measures of progress in learning mathematics.
Many measures of progress can be documented,
each in its own log.

Logs for the portfolio

1) Table, with the chronologic listing of i) dates on which the class met, ii) all assignments given on each date, iii) a note whether or the student attended class that day, or not, and iv) assessments from that day (fact check, quiz, test, activity).

2) Table, with chronologic listing of i) the main topics of e-mail ESSAY submissions, ii) the dates submitted, and iii) the grades received.

Personal Grade book

- Back- up to instructor
- Enables student self-grading
- Experience with diverse tables

* * * First experience with grade book concerns for many education students

Math as a tool **for** humans, **by** humans.

UAS-K Mathematics Math _____ Assignments Log page _____

Date	Attended/Not	Assignment Given	Grades Received

E-Mail Journal Entries Math 055

Word

E-log

	Date and Time		Main Topic	Mode of Submittal	Points
centimeter	Sept. 3, 1998	1	Mixed Review Problem in 9.1	E-mail Netscape @ Home	+10
Absolute Value	Sept. 10, 1998	2	Evaluate |4| |-3| -|-7| |115|	E-mail "	+10
Vector	Sept. 18, 1998	3	Doing Problem 23 on pg. 1-47	E-mail	+10
Magnitude	Sept. 25, 1998	4	Current + Proposed Route to Airport	E-mail	+10
Scientific Notation	Oct. 1, 1998	5	Doing Problem 8 Pg. 2-36	E-Mail	+10
Exponent	Oct. 9, 1998	6	Doing Problem 9 Pg. 2-36	E-mail	+10
PI	Oct. 15, 1998	7	History of PI	E-mail	+10

UAS-K Mathematics Math 105 Quiz & Test Checklist

Item name	Date taken	Date corrected	score	Notes
Syllabus Quiz	1.19.1	1.25.1	7/10	Should of seen it coming
Quiz 1	1.24.1	1.27.1	9/10	!
Quiz 2	1.31.1	2.3.1	19/20	
Quiz 3	2.7.1	2.10.1	7/10	
Quiz 4	2.21.1	2.24.1	9/10	
Exam 1	2.16.1	2.24.1	42/50	
Quiz 5	2.28.1	3.2.1	19/20	
Quiz 6	3.	3.2501	9/10	

Logs for the portfolio cont.

3) A comprehensive compilation of i) all QUIZ and EXAM questions and problems, with ii) a correct solution supplied for each.

4) Table for “TOOLS of the TRADE” introduced and/or used in the course, with i) a listing of each tool’s name, ii) a description of the context for using the tool, and iii) an example for its use.

Mathematical tools include but are not limited to: formulas, algorithms, theorems, valuable facts.

Logs for the portfolio cont.

5) A listing of all technical words / VOCABULARY, symbols, and abbreviations introduced in class and in the text. Definitions and examples of use may be included, but are not required.

6) A comprehensive compilation which i) gives the goal of each CALCULATOR USE encountered in class or in the text, and ii) gives commands and chains-of-commands associated with each use.

7) A compilation including i) one EXAMPLE of independent work from each chapter of the text, and ii) written self-assessments, as assigned.

ARTIFACTS

For student: Reference center, now and later

Documentation to grease transfer credit

Self-reflection and assessment device

enables learning from mistakes

For Instructor: More to grade…but worth it as:

Back up, refresher, and overview

Concrete evidence of student involvement applied to critical thinking

For Program: Concrete, compact, comprehensive

Not an add-on

UAS-K Mathematics SELF-ASSESSMENT

Put in log 8

1. You recently took an "open portfolio" exam in this class.

2. Answer the following questions regarding the usefulness of your portfolio as a tool for aiding your test-taking effort.

i) Did you find your portfolio helpful in taking this exam? Yes
How?
It gave me a comfort level knowing it was there to help jog my memory if needed.

ii) Which of the eight logs in your portfolio did you access while you were taking this particular exam? What information did you seek in each?

UAS-K Mathematics SELF-ASSESSMENT

1. Choose one example of your work from the assigned applications (word) problems in Chapter 3. Place this example into Log 8 of your portfolio.

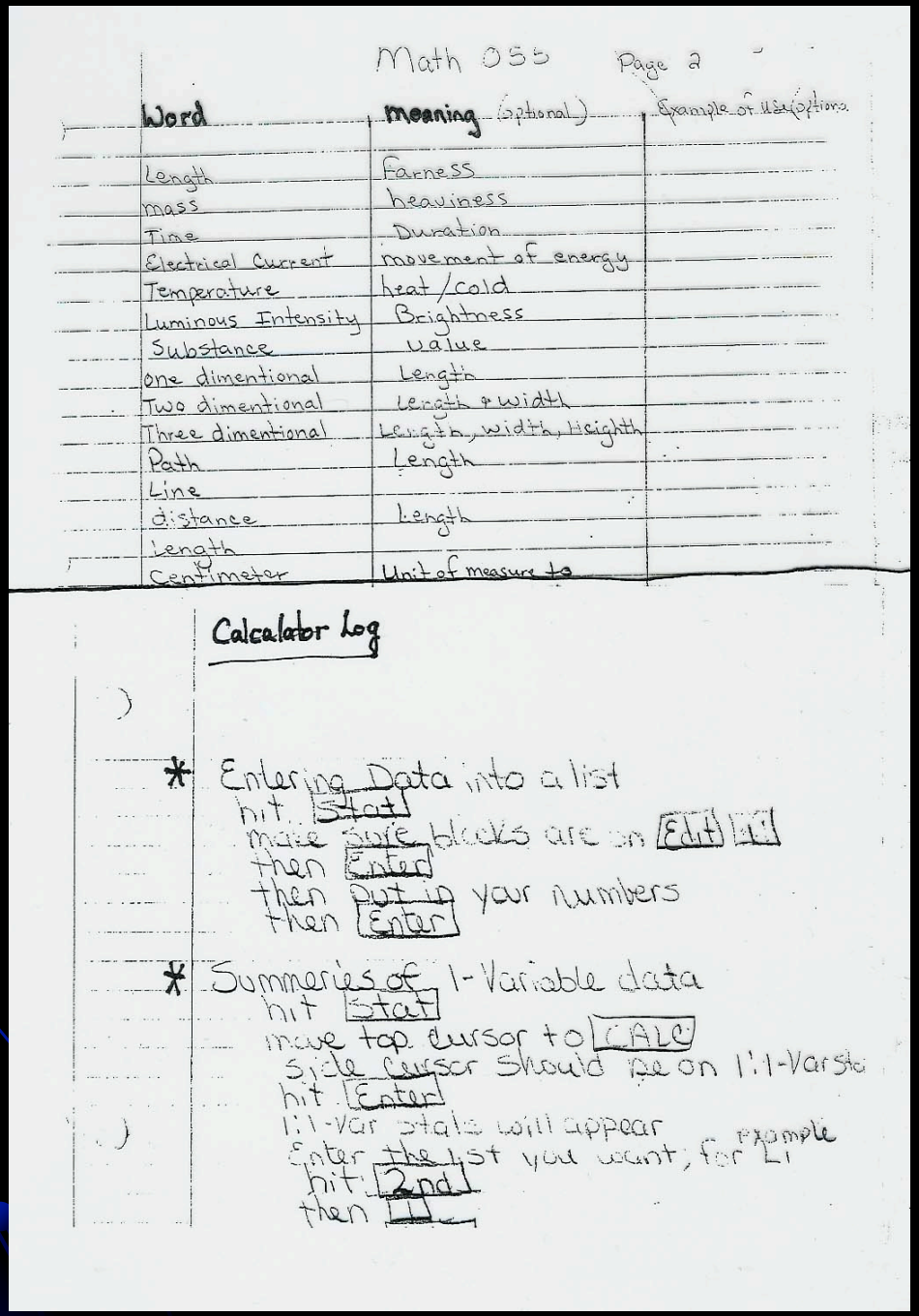
The problem you choose should demonstrate your best efforts. It should be the one problem that you would have me score as if it were an Olympic event, where considerations for 1) difficulty, 2) completeness, and 3) accuracy will be taken into consideration before assigning a score for it.

2. Answer the following questions regarding this one example of your work. Place this page into Log 8 of your portfolio, next to the example of work it pertains to. (use the back of this page if needed)

iii) Does your solution to this problem address each of the four stages of Polya's process for quantitative problem solving? If not, which guideline(s) did you omit? Why? ① I understood the problem. I knew the meanings of the words.
② My plan was to take it one step at a time solving each problem as I went.
③ I carried it out. ④ I checked.

iv) Which of the four stages proved to be the most difficult in your attempt to solve this problem? In looking back to check, I wasn't able to determine if a different method to solve could be found.

v) In what context have humans encountered similar problems in the past?
Anytime a bridge or some kind of infrastructure is built. Calculations would need to be done so,



Math 055 Page 2

Word	meaning (optional)	Example of it's options
Length	Farness	
mass	heaviness	
Time	Duration	
Electrical Current	movement of energy	
Temperature	heat / cold	
Luminous Intensity	Brightness	
Substance	value	
one dimentional	Length	
Two dimentional	Length + width	
Three dimentional	Length, width, Height	
Path	Length	
Line		
distance	Length	
Length		
Centimeter	Unit of measure to	

Calcalator Log

* Entering Data into a list
  hit [Stat]
  make sure blocks are on [Edit] [1:]
  then [Enter]
  then put in your numbers
  then [Enter]

* Summeries of 1-Variable data
  hit [Stat]
  move top cursor to [CALC]
  side cursor should be on 1:1-Var Stats
  hit [Enter]
  1:1-Var stats will appear
  Enter the list you want; for example L1
  hit [2nd]
  then [1]

Log of Logs: a portfolio

Focused on traditional mathematical content, students gain guided experience with:

Job Skills--documentation

Information literacy

Manipulation of information formats (especially tables)

Communications skills

Critical thinking

Professional behavior and Self-assessment

…and good study habits

Keeping track
of diverse forms of information

underlies the search for patterns,
in quantitative and qualitative data.
It is a natural to be taught
in the mathematics classroom.

Mathematics includes
Intrinsic Beauty **AND** Usefulness