

Sinclair Mathnet

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FROM THE CHAIR



In preparing for our recent biannual department review, I gathered a good deal of information in an effort to assess the effectiveness of the student success and retention initiatives that we have been gradually implementing since 1997/98. Copies of the report that was prepared are available in the Math Office, but I would like to highlight some of the more interesting results that I found.

Three categories of assessment information were gathered:

1. Data on student usage of programs and opportunities that we provided,
2. Data on student exam and grade performance, and
3. Student comments about the programs and opportunities provided.

Student use of the Math 101 and 102 practice exams grew by over 19% in 1999/00 in the second full year of operation, and, based on the present rate of use, will grow another 6% this year to over 2000 practice exams taken. So too on the rise is student participation in the retention program and attendance at the study skills workshops we have been offering. The number of student visits to these offerings in the first two quarters of this year is already 96% of what it was in three quarters last year. Also, once the Spring figures are in, it appears that Help Room visits will have grown by about 6% in this second year of operation. If we combine the outside-the-classroom help sessions that students have received from all sources (Math Lab, Retention Project, workshops, Help Room and Catch-Up sections), we find a 66% increase since 1996/97 when only the Math Lab was available. This is based on conservatively projected figures for this Spring Quarter. There is no doubt that many, many students are utilizing these opportunities, but many more need to. We must find out how to get more students engaged in these activities and expand our resources so that we can meet their needs.

When we look at student exam and grade performance, there is much that is encouraging and much that is not. It

is interesting to look at some information pertaining to courses for which we have targeted initiatives. The Math 101 final exam average is 2.3 points higher so far this year than it was in 1996/97, and the Math 102 average is 6.68 points higher. The Math 101, 102, 108 sequence embedded assessment raw score was 6% higher this year than in 1996, and the 101, 102, 116 assessment was 4% higher. This is in spite of the fact that the assessment is always given in Fall Quarter, which is now three days shorter than it was in 1996. The Math 116 success rate (success rate defined as the number of As, Bs, and Cs as a percent of all the As, Bs, Cs, Ds, Fs, and Ws) is 1.1 points higher so far this year than it was in 1996/97, and the Math 122/220 success rate is 11.33 points higher. But the Math 101 success rate is 4.27 points lower than in 1996/97, the Math 102 success rate is 2.6 points lower, and the Math 131/132 success rate is 1.1 points lower.

But I do not think that success rate adequately measures the success of our efforts, because it is sensitive only to grades moving from the D, F, W category into the A, B, C category. Therefore I have looked at a more sensitive measure that I am calling *performance average*. This is like GPA except that it gives 5 points for an A, 4 for a B, 3 for a C, 2 for a D, 1 for a W and 0 for an F. Unlike GPA it is responsive to the number of Ws, and values a W over an F. Although some of our efforts are targeted at particular courses, such as practice exams for Math 101 and 102 and the lab component in Math 122/220, others, like the Help Room and the workshops, help students in all courses. Furthermore, helping students in courses such as 101, 102, and 116 should result in improved performance in other courses as well. In light of all this, perhaps a "bottom line" statistic that we might want to pay attention to would be the performance average of all our 23 courses. I looked at this all the way back to 1993/94. What I found was an alarming steady decline from 2.79 in 1993/94 to 2.48 in 1997/98, an 11% decrease over four years. One can only speculate as to the cause of this – perhaps grade deflation, perhaps students coming to us less and less well prepared, perhaps something else. In any case, we find that at just about the time we began to institute our retention efforts (1997/98) the decline is arrested and instead a modest improvement of slightly 1% over the next two years ensues. This gives us reason to hope. (Continued on Page 6.)



Part-time Faculty Member of the Year



Al Giambro presents Jeanne Schlagetter her award at the Spring Quarter Department Colloquium.

This year's recipient of the Part-time Faculty Member of the Year Award is Jeanne Schlagetter, who was presented with a certificate and a gift bag at the Department Colloquium on April 27.

Jeanne is no newcomer to the Mathematics Department. She has taught here part-time for twenty years. She says that she thought of Sinclair as an "up and coming" school, and she started teaching here in the hopes of continuing when she retired from her full-time job.

This is Jeanne's second year of retirement from full-time teaching. She taught for over 27 years, with 26 years at Butler High School. Before she started teaching, Jeanne was a computer programmer for NCR. Of this experience she says, "That was when Carl the repairman walked inside the computer for repairs – always problems with the magnetic drum memory."

Jeanne was born and raised in the Dayton area. She received a Bachelor of Science degree in liberal arts at Bowling Green University, and earned a teaching certificate from Wright State University in 1971. In August of 1977, she received a Master of Education degree from Wright State University.

Jeanne has many interests outside of teaching. She is a synchronized swimmer, and swims with the

Dayton Synchronettes. The group won the 2000 U.S. Masters High Point Championship. She looks forward to her next competition with the Synchronettes in October in Arizona. Jeanne has also been taking golfing lessons this quarter at Sinclair, but says "I am not sure if I'll ever be brave enough to play a golf course." She also enjoys sewing, yard work, sailing, riding her jet ski, and reading mystery novels.

Jeanne manages to find time to volunteer at Hospice, which she finds very rewarding.

Of her experience teaching, she says, "It is so great to teach here at Sinclair! The students are nice and many really want to learn (such a difference from high school)."

Jeanne has two daughters and 4 grandchildren. Her daughter Jackie lives in New York City with her husband and their children Phil and Meg. Jeanne's daughter Vickie resides in Tipp City with her husband and their children Jill and Krissy.

Please congratulate Jeanne on this well-deserved honor!

Susan Harris ■

Reminders

- Please be sure that you clearly understand the department's calculator policy (found on page 5.3 in our departmental Part-time Faculty Handbook and on the department's web page under course information), and state your individual policy clearly on your syllabus for your students. This should include clear information of what kind(s) of calculator(s), if any, will be permitted on tests. Be sure to advise students in advance if you will be clearing calculator memories before a test.
- Remember to turn your text in to the Math Office if you will not be using it during the Summer or Fall Quarter so that it will be available for others.
- Please do not assign incomplete grades inappropriately. You can read the explanation for proper use and procedure on page 4.2 of your departmental Part-time Faculty Handbook.



Legislating the Value of Pi

Many of us may not know that legislators once tried to legally establish a rational value for the irrational number pi. It all happened back in 1897, when Dr. Edwin Goodwin introduced a bill in the Indiana House of Representatives. If this bill had been passed into law, a "new" value of pi would have been established, and Dr. Goodwin would have had the rights to the royalties ensuing from its use. The Indiana House actually approved the bill (unanimously), but it was defeated in the Senate.

The bill does not specifically state a value for pi, and the wording of the bill is somewhat confusing. In it, Dr. Goodwin claims to have trisected the angle, duplicated the cube, and squared the circle, and it was his solutions to these problems that appear to have implied a value for pi equivalent to 3.2.

In the bill he states that his answers to these three questions that "had been long since given up by scientific bodies as insolvable mysteries and above man's ability to comprehend" had been accepted by the American Mathematical Monthly, though in reality they had not.

The text of the bill is reproduced here for you to peruse.

ENGROSSED HOUSE BILL No. 246

A Bill for an act introducing a new mathematical truth and offered as a contribution to education to be used only by the State of Indiana free of cost by paying any royalties whatever on the same, provided it is accepted and adopted by the official action of the Legislature of 1897.

Section -1- Be it enacted by the General Assembly of the State of Indiana: It has been found that a circular area is to the square on a line equal to the quadrant of the circumference, as the area of an equilateral rectangle is to the square on one side. The diameter employed as the linear unit according to the present rule in computing the circle's area is entirely wrong, as it represents the circle's area one and one-fifth times the area of a square whose perimeter is equal to the circumference of the circle. This is because one-fifth of the diameter fails to be represented four times in the circle's circumference. For example: if we multiply the perimeter of a square by one-fourth of any line one-fifth greater than one side, we can in like manner make the square's area to appear one-fifth greater than the fact, as is done by taking the diameter for the linear unit instead of the quadrant of the circle's circumference.

Section -2- It is impossible to compute the area of a circle on the diameter as the linear unit without trespassing upon the area outside of the circle to the extent of including one-fifth more area than is contained within the circle's circumference, because the square on the diameter produces the side of a square which equals nine when the arc of ninety degrees equals eight. By taking the quadrant of the circle's circumference for the linear unit, we fulfill the requirements of both quadrature and rectification of the circle's circumference. Furthermore, it has revealed the ratio of the chord and arc of ninety degrees, which is as seven to eight, and also the ratio of the diagonal and one side of a square which is as ten to seven, disclosing the fourth important fact, that the ratio of the diameter and circumference is as five-fourths to four; and because of these facts and the further fact that the rule in present use fails to work both ways mathematically, it should be discarded as wholly wanting and misleading in its practical applications.

Section -3- In further proof of the value of the author's proposed contribution to education and offered as a gift to the State of Indiana, is the fact of his solutions of the trisection of the angle, duplication of the cube and quadrature of the circle having been already accepted as contributions to science by the American Mathematical Monthly, the leading exponent of mathematical thought in this country. And be it remembered that these noted problems had been long since given up by scientific bodies as insolvable mysteries and above man's ability to comprehend.



THE MATH 101 PROJECT: A PROGRESS REPORT

Since the last report in *Mathnet* (March 2000), the MATH 101 Project Committee has conducted the second pilot (Beta Pilot) of the Alternative Algebra Learning Laboratory (A^2L^2) and has completed assessment of both the Alpha and Beta Pilots.

Assessment of both pilots included six statistical comparisons with a control group of traditional sections of 101 taught previously or concurrently by the pilot instructors. These comparisons were:

- Proportion of students who succeeded in the course
- Retention rate
- Average final exam grade
- Average course grade
- Leniency index
- Proportion of students who succeeded in their next math course

For the Alpha Pilot, only one comparison showed a significant difference between the pilot group and the control group: a higher average final exam score in the pilot group. When the data was analyzed closely, however, the difference was seen to result from the higher scores of the students in the pilot classes who continued with the traditional style of instruction. Thus, this result was not greatly encouraging to the project committee.

For the Beta Pilot, none of the six comparisons revealed any significant difference between the pilot group and the control group. It was noted, however, that in at least one case (proportion of students who succeeded in their next math course), the difference in proportions may have been statistically significant in favor of the pilot classes if the sample sizes had been larger.

For the Alpha Pilot, three types of surveys were used to assess the A^2L^2 : student evaluations, instructor observations and tutor observations. Results of these, especially the instructor observations, played a key role in making changes for the Beta Pilot. For the Beta Pilot, students were

given two surveys and instructors submitted personal observations. Almost three-fourths of the Beta students felt that the modified course structure and approach was effective. Overall, the instructors preferred teaching MAT 101 in this format rather than the traditional mode and found the lab time to be especially valuable for the instructor to connect with individual students as well as for students to work with each other. Still, it was the consensus that a student's success in the course rests heavily on his or her motivation and time to commit to the goals of the course.

The Project Committee feels that there is definite potential for success in this new learning mode, but that it will take more time to show a noticeable improvement. The Learning Challenge Grant Team has approved an extension of the project so that a third pilot, the "Gamma Pilot," can be conducted during Winter Quarter, 2002. The plan is to offer four classes in the lecture/lab style.

Further information about the assessment of the first two pilots is available from the Mathematics Department Office.

Susan Myers ■

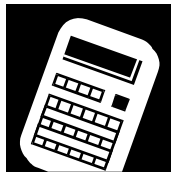


The top five Sinclair cumulative winners of the 2000-2001 American Mathematical Association of Two-Year Colleges (AMATYC) Student Mathematics League Competition were recognized at the Department Colloquium in April. Pictured above, the winners (l - r) are Martin Eilders (first-place winner and recipient of \$100 prize), Elise Davis, Doug Nieport, Linh Luu and Tom Cliett. Congratulations to these students!



ARE GRAPHING CALCULATORS ELECTRONIC CHEAT SHEETS?

The answer to this question can be yes. Some students may store formulas or notes in the memories of graphing calculators that are not permitted to be brought to a test. Not all of these students are intentionally trying to cheat. Some may have downloaded information from another student and are not aware of what is in the memory or know how to access it. They also may not know how to delete it even if they wanted to.



What follows are some suggestions and directions for instructors to avoid this problem.

First of all, make your policy clear on the syllabus and announce it in class. Putting the policy in writing on the syllabus, explaining it on the first day of class, and then again when the test is announced should be sufficient. It is suggested that you tell the students that no information that is supposed to be memorized for the test may be stored in the memory of the calculator, and tell them that you will check to see if this rule is being followed.

Here are some methods you can use to assure the policy is followed.

1. Require the memories of all calculators to be cleared at the start of each test.

- To do this on the TI-83 press the 2nd key and the + key; press the 5 key for Reset; press 1 for All Memory; Press 2:reset.
- On the TI-83 Plus: press the 2nd key and the + key; press 7:reset press 1: All RAM; press 2:reset
- On the TI-86 press 2nd and the 3 key; on the TI-85 press the 2nd and + key for MEM; press F3 for RESET; press the F2 key for MEM; press the F4 key for YES.

Advantage: The instructor is assured that no student has anything inappropriate in the memory of the calculator. This is the easiest method for the instructor.

Disadvantage: This is the least popular method from the student's perspective, since they may have some other information stored that is allowed in other classes, or games that they do not want to lose.

To avoid this problem:

a) Tell the students (with sufficient lead-time) that they can go to the Math Lab with their own disk and download the memory to it, and then after the test they can go back and upload the data (saved on the disk) back into the calculator memory. There will be directions in the Lab on how to do this. It only takes a few minutes, but it would not be advised in the few minutes before the test!

b) Talk to Barbara Carruth (Room 1317) to see if there are any unrented calculators (with cleared memories) that you can take to class and loan to the student while he/she takes the exam. To be safe, check with Barbara at least the day before the test to be sure she will be there when you need to pick up the calculators, and so that she can confirm what types of calculators and how many are available. Contact her at Barbara.Carruth@sinclair.edu or 512-2237.

2. Check the memories of the calculators for specific programs that should not be there, and delete them individually.

- For directions on how to do this contact Barbara Carruth, and she will send you the information. (It takes another page of commands!)

Advantages: It removes only the forbidden information and leaves other programs, so it is more popular with students. Also, the instructor will get a

clue as to which students have brought in such information and need to be instructed on how to remove the material.

Disadvantages: This is the most work for the instructor, and does not guarantee that a clever student cannot hide something that will not be detected.

Although this looks complicated, with a little practice instructors can still have the advantages of using or permitting graphing calculators in their classes without the worry of their abuse for cheating.

Barbara Carruth ■



Just Thinking

Here are some useful English System conversions and units.

- Ratio of an igloo's circumference to its diameter = Eskimo Pi
- 2.4 statute miles of intravenous surgical tubing at Yale University Hospital = 1 I.V. League.
- 2000 pounds of Chinese soup = Won Ton
- 1 millionth mouthwash = 1 microscope
- Speed of a tortoise breaking the sound barrier = Mach Turtle



(Continued from Page 1.) Questionnaires completed by students from the Math Lab and Math Help Room, as well as students participating in the Retention Program, tell us that the students taking advantage of these opportunities consider them helpful and want more of the same. Typical comments include: "Need more than one instructor helping students," "An excellent place to study and ask others for help," "...staff are very helpful," "I love the practice test. It has helped me a lot," "Thank God for the Math Lab," "I would encourage anyone having problems with math to check out the wonderful tutor lab and Math Lab," "The 30 minute sessions (retention program) could have been longer," and "I strongly encourage Sinclair to broaden this program (retention program) so that more people like myself can successfully complete the courses."

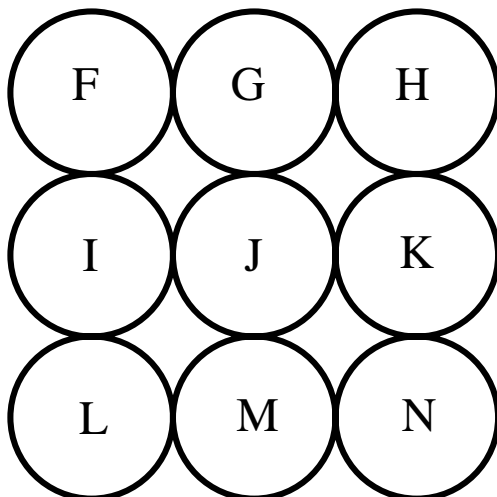
From all of this it appears to me that our efforts are having some impact. But there needs to be more. Our challenge over the next several years will be to expand the current programs as well as to look for creative new ideas to try to improve students' success.

Al Giambrone ■

Cryptic Math

Each of the nine letters stands for one of the numbers one through nine. Using the clues below, can you deduce the number represented by each letter?

1. G is smaller than both F and M; F is smaller than H.
2. I is an even digit, and $L = I + 2$.
3. If K is added to L, the result is N, which is a perfect square.
4. The product of G and J is a 2-digit number whose rightmost digit is M.



Harvey's Joke Corner

Q: Name a pair of presidential "prime twins."
A: The Bushs. (Presidents #41 and #43)

If the Dayton Dragons would take on more team sponsors, including First National Bank, the Seventh Day Adventists Church, and the Second Time Around Music and Video Company, they could rename the ballpark First Second Third Fifth Seventh Field. [Bob Batz – *Dayton Daily News*]

Convert these sayings to their measurements:

- a. 28.4 g of prevention are worth 4.54 kg of cure.
- b. First down and 30 feet to go.
- c. A miss is as good as 5280 feet.
- d. 157 cm, eyes of blue...



Thanks for reading the "Joke Corner" this year!