

# THE MATH LOCUS

Vol. Winter 06.1



Published periodically by the Mathematics Department at Kirtland Community College, Roscommon, Mich.  
<http://kirtland.edu/themathlocus>

## About us

Winter semester 2006 is well under way and the Tutoring Center at Kirtland Community College has a fine group of tutors. This list includes students, paraprofessionals, instructors and a director. We are all *one in the math* and most of us are proud to be called math nerds.

- Whitney Barnes can be seen at the reception desk in the Tutoring/Learning Center. She is very helpful to everyone, especially to Kate Jakobson, the Learning Center's director.

- Erinne Baughn is an adjunct faculty member of the Math Department. This is her first semester at KCC as an instructor and tutor.

- Emilee Bruner is a member of Kirtland's Lady Firebirds basketball team and is an education major.

- Naomi Butler is a calculus student.

- Brian Gomez likes computers and *he really enjoys math*, as well as "The Lord of the Rings."

- Jacob Greene tutors in computer science (but

**Continued on back page**

## Service Learning: Alive and well at Kirtland

And we have Nick Holton to thank for that fact. If you want for information about Service Learning, please look into the Web site: <http://www2.kirtland.edu/service-learning/News/Default.htm>.

All of the tutors in KCC's Tutoring Center are dedicated to helping others. They are the lifeline to those who want to improve in their studies at Kirtland Community College. They are an example of Service Learning in action with mathematics.

Here is the personal story of one of our tutors.

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My name is Terri Hooper. This is my third year at Kirtland, and I will be graduating this summer with an associate in applied science degree. I am currently in Nick Holton's finite math class.

Nick involves his students in a Service Learning project, which consists of giving a small amount of time in a community service position that in some way helps the community. The four hours of community service given needs to relate to the field that you are pursuing, in some way. I plan on working in a



Many faculty members at Kirtland Community College encourage students to participate in Service Learning activities in their community. Terri Hooper (right) is a Kirtland student who has chosen to participate in Service Learning by helping out in her son's algebra class at Houghton Lake Middle School. She is pictured above with her son, Trey (left), and her daughter, Lauren.

hospital setting, preferably in an administrative role, but I sometimes imagine the role that Nick and Kevin Baughn play at our college, along with all the other great math teachers here at Kirtland.

I want to know how awful their job really is! No, really they seem to be excited and almost passionate about what they are teaching us. Beats me!

My 13-year-old son, Trey, attends Houghton Lake Middle School and he has an algebra class during his first

hour. When he needs help with his homework I feel good that I actually know what he is doing. When I was in school my parents always told me that they didn't understand the "new math."

I thought that I would kill two birds with one stone. I will do my Service Learning project and completely end my son's social life at the same time. That is called multi-tasking.

I decided to help out in his middle school algebra class. I

**See SERVICE, page 8**

# PI DAY!



**Join the fun in the Tutoring Center on  
Tuesday, March 14, at 1:59 p.m.  
(and all afternoon!)  
to celebrate the  
300th birthday of pi!**

**Third month, 14th day,  
1:59 in the afternoon**

**(Pi = 3.141592653589793238462643383...)**

In 2002, Professor Kanada at Tokyo University announced the calculation of pi to 1.2411 trillion places. This new calculation is more than six times the record recognized by "Guinness World Records" of 206.158 billion places.

Only 39 decimal places of pi would be sufficiently precise to inscribe a circle around the visible universe that doesn't deviate from perfect circularity by more than the radius of a single hydrogen atom.

The Bible uses a value of pi of 3. Here is a verse from I Kings 7,23: *And he made a molten sea, ten cubits from one brim to the other: it was round all about, and his height was five cubits: and a line of thirty cubits did compass it about.*

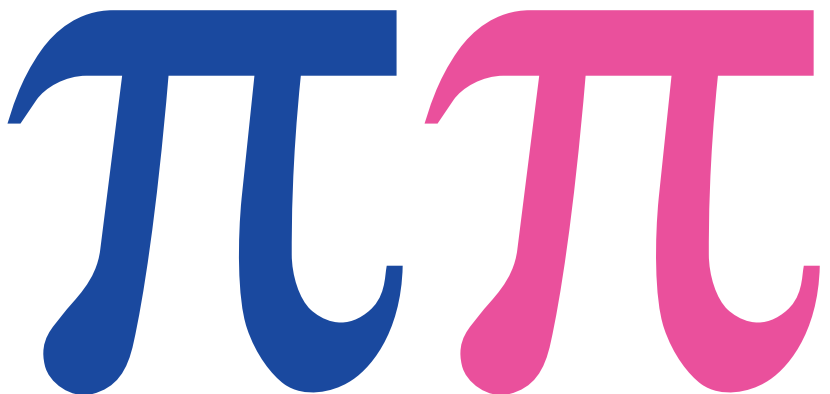
If a billion decimals of pi were printed in ordinary type, they would stretch from New York City to the middle of Kansas.

Want to find your birthday or any other significant date isn pi? You can do that! Satan (666) turns up in pi at position 2,440. Whew!

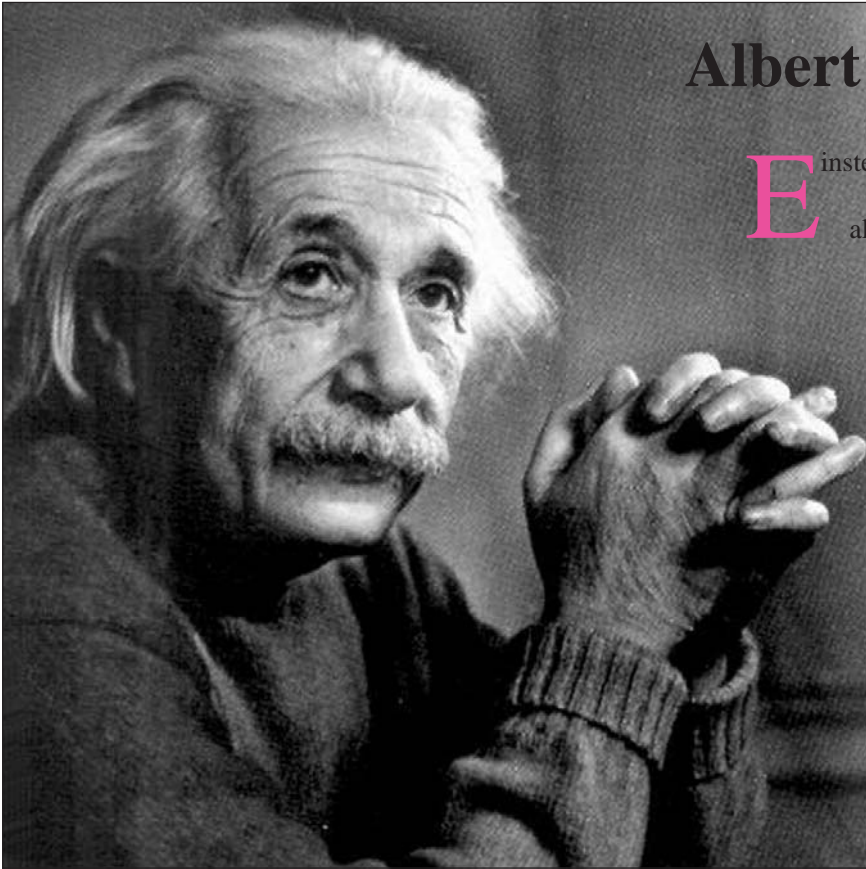
**A free pi(e)  
goes to all who can  
demonstrate a definition of pi,  
or bring us an interesting  
fact about pi.  
Festivities continue all  
afternoon!**

**William Jones introduced the symbol  $\pi$  in 1706.  
This year  $\pi$  will be 300 years old.**

**Happy Birthday  $\pi$ !**



**It is also the 125th birthday of Albert Einstein!  
Happy Birthday Albert!**



## Albert Einstein's Early Life

(1879 - 1955)

**E**instein was born in Ulm, Germany on March 14, 1879. Einstein failed an examination that would have allowed him to pursue a course of study leading to a diploma as an electrical engineer at the Swiss

Federal Institute of Technology. He spent time in Aarau at a secondary school, where he enjoyed excellent teachers and first-rate facilities in physics. Einstein returned in 1896 to the Swiss Federal Institute of Technology, where he graduated in 1900 as a secondary school teacher of mathematics and physics.

By 1909, Einstein was recognized throughout German-speaking Europe as a leading scientific thinker. In quick succession he held professorships at the German University of Prague and at the Swiss Federal Institute of Technology. In 1914 he advanced to the most prestigious and best-paying post that a theoretical physicist could hold in central Europe, professor at the Kaiser-Wilhelm Gesellschaft in Berlin.

Albert Einstein was awarded the Nobel Prize in Physics in 1921.

Taken in part from <http://www.humboldt1.com/~gralstro/Einstein/early.html>

## Albert Einstein's Heart Quotes

*From [www.heartquotes.net/Einstein.htm/](http://www.heartquotes.net/Einstein.htm/)*

Albert Einstein:  $E = MC^2$   
(Theory of Relativity)

God does not care about our mathematical difficulties.  
He integrates empirically.

*Sign hanging in Einstein's office at Princeton*  
Not everything that counts can be counted, and not everything that can be counted counts.

The whole of science is nothing more than a refinement of everyday thinking.

Imagination is more important than knowledge.

We can't solve problems by using the same kind of thinking we used when we created them.

Gravitation is not responsible for people falling in love.

If A is a success in life, then A equals x plus y plus z.  
Work is x; y is play; and z is keeping your mouth shut.

Weakness of attitude becomes weakness of character.

Teaching should be such that what is offered is perceived as a valuable gift and not as a hard duty.

Sometimes one pays most for the things one gets for nothing.

Anyone who has never made a mistake has never tried anything new.

I am content in my later years. I have kept my good humor and take neither myself nor the next person seriously.

February 2006

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Cupid's Little "Arrows" >>>	Brian Gomez Dan Savage Whitney Barnes Melinda Bondiette	Kate Jakobson Geneene Warren Helen Scheer Jan King	$(100)^0$	$2(\sin^2 + \cos^2)$	$3 X^0$ where X equals 4000	Number of equal sides in a square
Number of sides in a pentagon	Number of minutes in an hour divided by 10	Number of days in a week	$4\sqrt[3]{8} + 40$ 6	Number of lives per cat	$10^5$ ----- $10^4$	Movie "Ocean's ???" or 1011 (binary)
$3\sqrt{(16)}$	Baker's Dozen	Cupid's Busy Day	X V	Number of ounces in a pound	The number of hours per day for drop-in tutoring (8:30 - 4:30) plus nine	One and one half dozen
What is a prime number greater than 17 and less than 20.	$3^2 + 3(23) + 2^5 + X = 130$	Age of majority	21.96 rounded to the tenth place	Complementary angle of 67 degrees	What is the minimum point of the graph: $Y = X^2 + (4)(6)$	$\text{Log}_5 X = 2$
Two Bakers' Dozens	$3^3$	$(25+36 \times 28)^0 + 27$	Supplementary angle of 151 degrees	More of Cupid's Little "Arrows" >>>	Jennifer Handrich Willie Martin Chad Schultz	

## HOW TO SOLVE NUMBER FILL-INS

A Number Fill-In is solved just like a regular Fill-In, using numbers instead of words. Each digit in an across entry is part of a down entry. We provide you with the lists of numbers, arranged numerically

by length. To solve a Fill-In, start with the given number in the diagram and look for possible crossings. Pencil in one choice from the List. Now, look at the List and check to see if there are

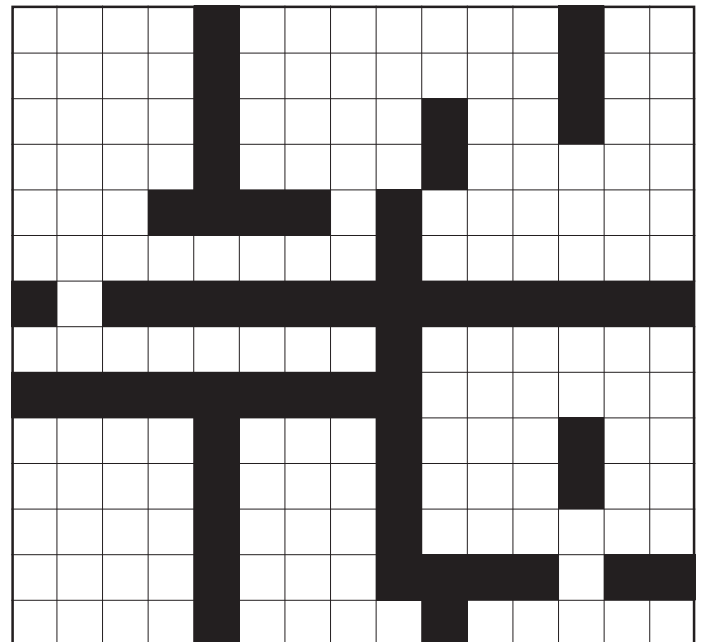
entries in the List that can cross your penciled-in choice. For example, if your penciled-in number starts with a "6," be sure there is a crossing entry with a "6" in the correct position. If there isn't, pen-

cil in another possibility. Continue until you are sure your number is the one that fits there. Then, cross off that choice from the List. As you solve, the List gets smaller and solving is faster.

### NUMBER LIST

<b>2 DIGITS</b>	696	7968	68765	765349
15	716	8179	79876	849342
32	775	8179	81987	987561
43	796	8179	87243	987561
73	827	8764	92198	987561
75		9281	92198	
78	<b>4 DIGITS</b>	9281	98354	<b>7 DIGITS</b>
86	1392			7165384
97	1392	<b>5 DIGITS</b>	<b>6 DIGITS</b>	8276495
98	2197	13219	162564	
	2198	21886	198672	<b>8 DIGITS</b>
<b>3 DIGITS</b>	4732	43798	384786	24136938
273	5843	43798	516919	32189447
459	6542	51453	543126	57469362
495	6858	57664	738231	
695	6954	62564	765348	

PUZZLES BY HELEN



## February's secret code message

\_\_\_\_\_ :  
 2 4 2 7 8 5 1 0  
  
 M \_ V \_ \_ \_ Y \_ \_ \_ W A \_ \_  
 7 5 1 0 7 4 8 9 2 4 6 3 1 2 2 7 8 6  
  
 \_ \_ \_ P \_ \_ \_ \_ \_ \_ C C \_ \_ \_ F \_ L  
 5 1 6 3 3 1 6 3 1 2 9 4 3 9 9 4  
  
 L \_ A \_ \_ \_ \_ .  
 3 8 1 5 1 0

First clue: E I N S T E I N  
3 5 1 9 2 3 5 1

C  
L  
U  
E  
S

- Second set of clues:
- a) TEN - TEN = G
  - b) (G) \* (TEN) = G
  - c) USE + DOOR = OTON
  - d) (TEN)\*N = TEN
  - e) T + E + N = D
  - f) D + 1 = O
  - g) O + 1 = R
  - h) R + 1 = S

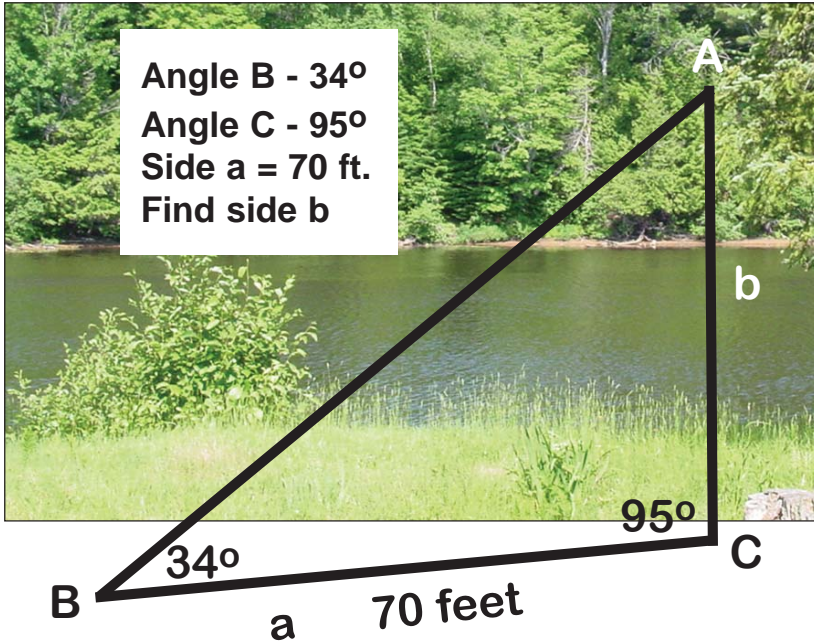
Good luck! Fill in the solution table below.

**Directions:** Each letter in the message is represented by a one-digit number. Use the clues given to assign the letters to each digit.

\_ \_ \_ \_ \_  
 0 1 2 3 4 5 6 7 8 9

# GO FIGURE!

## What is the distance across the river?



## Working with Compound Locus

Practice Locus problems can be found on the Web at <http://regentsprep.org/Regents/math/locusCom/PracLocC.htm>

Try these:

1. What is the number of points in a plane two units from a given line and three units from a given point?

Is the answer one, two, three or four?

*Look for the explanation on the solution page.*

2. Draw the locus of points 4 units from a given point A and equidistant from two points 6 units apart.

How many points will satisfy both conditions?

*Look for the answers on the solution page.*

## The Game of Col

**What you need:** 1. A map to color; and  
 2. A different color of crayon for each of the 2 players.

**How to Play:** The first player colors any region of the map, and uses that color throughout the game.

The second player uses a different color and colors any region of the map. The second player also keeps the same color throughout the game.

The first player colors a region of the map, but cannot color a region that would cause 2 regions that share a boundary to have the same color.

The second player colors a region, but again, it must be a region that does not share a boundary with a

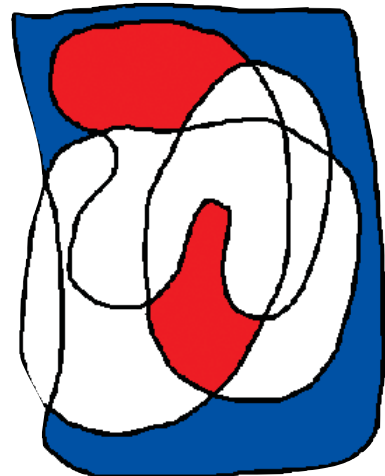
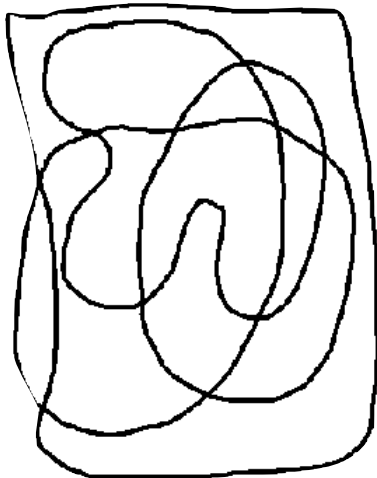
region that is already colored in the color that the second player is using. Notice, however, that two regions can be the same color if they meet only at a single point. A boundary has to be a line.

The game ends when one of the players is unable to find a region to color. That player loses.

Coloring appears over and over again in mathematics. Map coloring is a topic that has been studied for many years. Mathematicians have

also thought about ways that knots can be colored.

*This game is taken from the book On Numbers and Games by John Conway (Academic Press, 1976) and is attributed to Colin Vout.*



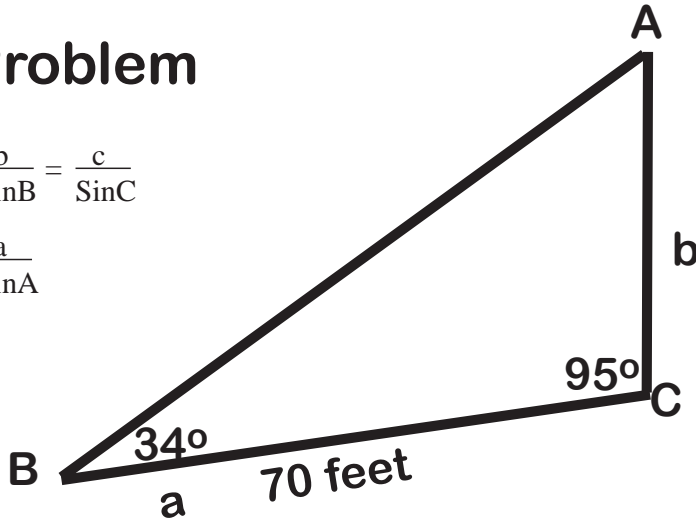
## The River Problem

Law of SIN:  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

$$\frac{b}{\sin B} = \frac{a}{\sin A}$$

$$\frac{b}{\sin 34^\circ} = \frac{70 \text{ ft.}}{\sin 51^\circ}$$

$$0.559 \quad 0.777$$



**Answer**  
“b” equals approximately 50 feet

$$LA + LB + LC = 180^\circ$$

$$A + 34^\circ + 95^\circ = 180^\circ$$

$$A = 51^\circ$$

## Secret Message

Tutoring:  
Moving your student toward independent successful learning.

## Pi Trivia Game

1. B; 2. D; 3. A; 4. A; 5. A

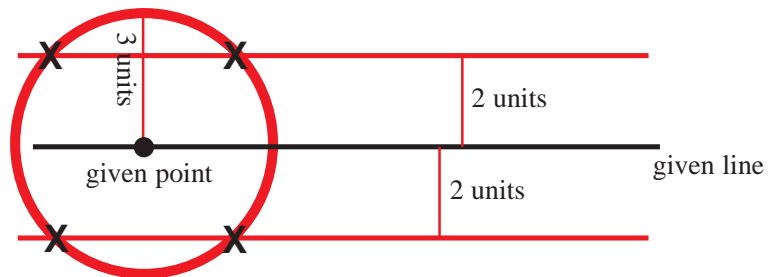
## NUMBER FILL-INS

1	3	9	2		8	2	7	6	4	9	5		9	7	
9	2	8	1		7	1	6	5	3	8	4		8	6	
8	1	7	9		6	9	5	4		7	3		7	5	
6	8	5	8		4	7	3	2		5	1	4	5	3	
7	9	6			4					1	6	2	5	6	4
2	4	1	3	6	9	3	8			5	1	6	9	1	9
		4													
5	7	4	6	9	3	6	2			8	4	9	3	4	2
										7	3	8	2	3	1
8	1	7	9		6	9	5			2	7	3		7	8
1	3	9	2		8	2	7			4	9	5		9	8
9	2	8	1		7	1	6			3	8	4	7	8	6
8	1	7	9		6	9	6						7		
7	9	6	8		5	8	4	3		6	2	5	6	4	

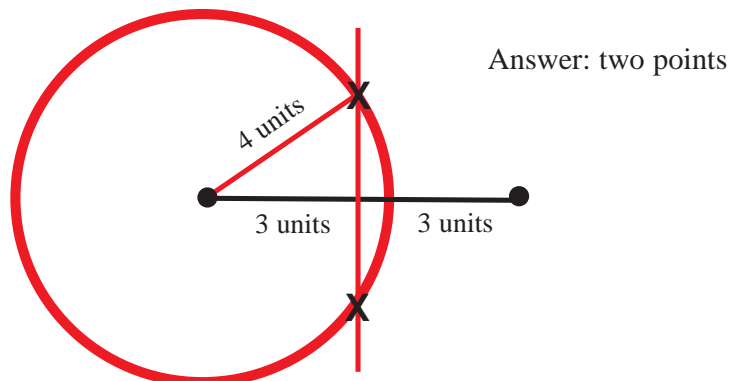
## Locus Problems

- What is the number of points in a plane two units from a given line and three units from a given point?  
Is the answer one, two, three or four?

Answer: four points



- Draw the locus of points 4 units from a given point A and equidistant from two points which are 6 units apart. How many points will satisfy both conditions?



Answer: two points

For assistance,  
call the Tutoring Center at 989-275-5000, ext. 379, or drop by!  
For a PDF version of  
The MATH LOCUS,  
log on the Web at  
<http://kirtland.edu/themathlocus>

## About Us

### Continued from front page

has not reached the nerd appreciation of math yet).

• Jennifer Handrich loves visiting the math tutoring room to see friends and enjoy the chocolate. Math is on the top of the list for her, also.

• Terri Hooper has a feature article in this issue of the LOCUS on the topic of Service Learning.

• Kate Jakobson is the professional and caring director of the Tutoring Center, with 20 years of math teaching experience.

• Jan King has a positive attitude about life and enjoys working with the students in the nursing field.

• Willie Martin tutors in AutoCad, Solidworks, descriptive geometry and a host of math courses.

• Jeremy Messerschmid dreams of being a dentist, perhaps an oral surgeon.

• Yvonne Musselman helps in transcribing math problems. You can always count on her showing up.

• Cassandra Nelsen and Rachel Sanderson plan to

tutor also.

• Don Savage loves science, technology and especially math ... another nerd.

• Helen Scheer is lead math tutor, math instructor and facilitator of the LOCUS. She is probably the oldest nerd on the block and she usually has chocolate on her desk.

• Chad Schultz took to Kirtland like a hog to a compost heap, squealing happily and getting into everything: tutoring, Student Senate, Phi Theta Kappa. He's a happy nerd.

• Genene Warren shares her years of experience and helps with ESL (English as a Second Language), learning disabilities, reading, writing, geology and more!

• Jon Wesoloski speaks Spanish and German. His hobbies include drawing, street racing, video games and CARS. The nerdiest thing about him is his obsession to carrying  $\pi$  to at least 32 places (3.1415926535897932384626433827950...). We will take his word for it!!

## Service

### Continued from page 1

think this will be exciting, because I enjoy math and working with the kids, who sometimes need the extra and individualized help, now more than ever.

I took my idea to Nick and explained how this is something I would like to try and he said "All right." I then told my family what I had proposed and thought that Trey would fall over dead. However, he actually was supportive and told me to make sure I request Mrs. Warner, first hour.

OK, cool, this sounds like it might work out nicely. The only thing he asked of me was to "Please do something with your hair when you come to my class."

I hope to get all of the paperwork done and start on this project early in March. In a later issue I can let you know how everything went.

## The Pi Trivia Game

Pay tribute to the magnificent transcendental number that we have all grown to love by testing your knowledge of history, mathematics, and even a little physics. Here are five fun pi-related questions, picked randomly from an exciting pi question database that can be found at [www.eveandersson.com/trivia/](http://www.eveandersson.com/trivia/)

1. It has been proven impossible to "square the circle." What does it mean to square the circle?

1. multiply a circle by itself
2. use a straightedge and compass to construct a square equal in area to a given circle
3. construct a square that perfectly circumscribes a circle
4. determine the value of pi squared
5. draw a circle with area equal to  $\pi * (r \text{ squared})$

2. What year were the first 100 digits of pi first calculated?  
1. 48 BC; 2. 1947; 3. 1492; 4. 1701; 5. 1812

3. At which decimal of pi does the earliest occurrence of the string 999999 begin?

1. 762; 2. 32; 3. 47,528; 4. 314; 5. 9,999

4. Which of these binary numbers is closest in value to pi:

1. 11.0010010000111111
2. 101.110101000111100
3. 10.0001101010110100
4. 1.10111011010010011
5. 111.010111101011111

5. Say you have a rope wrapped tightly around the earth at the equator. How much longer would you have to make the rope if you wanted the rope to be exactly 1 foot above the surface the whole way around? (Assume that the earth has a constant radius at the equator.)

1.  $2 * \pi$  feet
2.  $2 * \pi * R$  feet, where R is the radius of the earth
3.  $\pi * R^2$  feet
4.  $\pi + D$  feet, where D is the diameter of the earth
5.  $\pi/2$  feet

## Classifieds

**Tutors and tutees** are needed for mathematics. Apply at the Kirtland Tutoring Center (INS 20).

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**Contributions to** or inquiries about THE MATH LOCUS can be directed to Helen Scheer, publisher, at [scheerh@kirtland.edu](mailto:scheerh@kirtland.edu).

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or a career,  
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