

# THE MATH LOCUS

Vol. Fall 05.2



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

## About us

The tutoring center of Kirtland Community College wants to help students do better in their studies and, more often than not, math is the topic our students are struggling with the most.

In the classroom and in the tutoring center, the importance of mathematics for one's future must be stressed. The tutoring center sees anxiety and fear of failure in students' eyes. Success and positive self-esteem must replace poor attitudes. As we work through the change, it is necessary to step back in self-evaluation.

For decades, Kirtland Community College has recognized its responsibility to be involved in the process of evaluation for accreditation. Many educational institutions use the North Central Association Commission on Accreditation.

Recently, AQIP (Academic Quality Improvement Project) arrived to help with this  
**Continued on back page**



Will Jones, lead math tutor at Kirtland for many years, was named "Magnificent Tutor of the Year" in 2004 by the Michigan Tutorial Association. He is pictured above with his wife, Pam, a former tutee.

## Will Jones – a life of infinite variables shared with love

**By Tony Root**

ROSCOMMON — It was a funeral unlike any other, more like a casual gathering of friends than a memorial service. Rather than donning the typical formalwear, mourners arrived dressed in college sweatshirts and mismatched outfits.

And that's exactly how Will Jones, 58, of Roscommon wanted it.

The first time Jones was diagnosed with a brain tumor, it took only three months for him to recover, pronounced tumor-free in the fall of 2004. But earlier this year, doctors found a second brain tumor. This time, Jones' story would not have such a happy ending, but he knew what to expect, and, in his own unique way, he looked forward to it.

"I'm looking to go to the

other side, and I have been for some time now," said Jones, Kirtland Community College's lead mathematics tutor, in an interview just after he was diagnosed with his second brain tumor. "I will get to find out what the square root of negative one is. And I finally get to see what the fourth dimension looks like, so I'm kind of geeked

**See JONES, page 8**

# GO FIGURE!

## Christmas Tree Problem

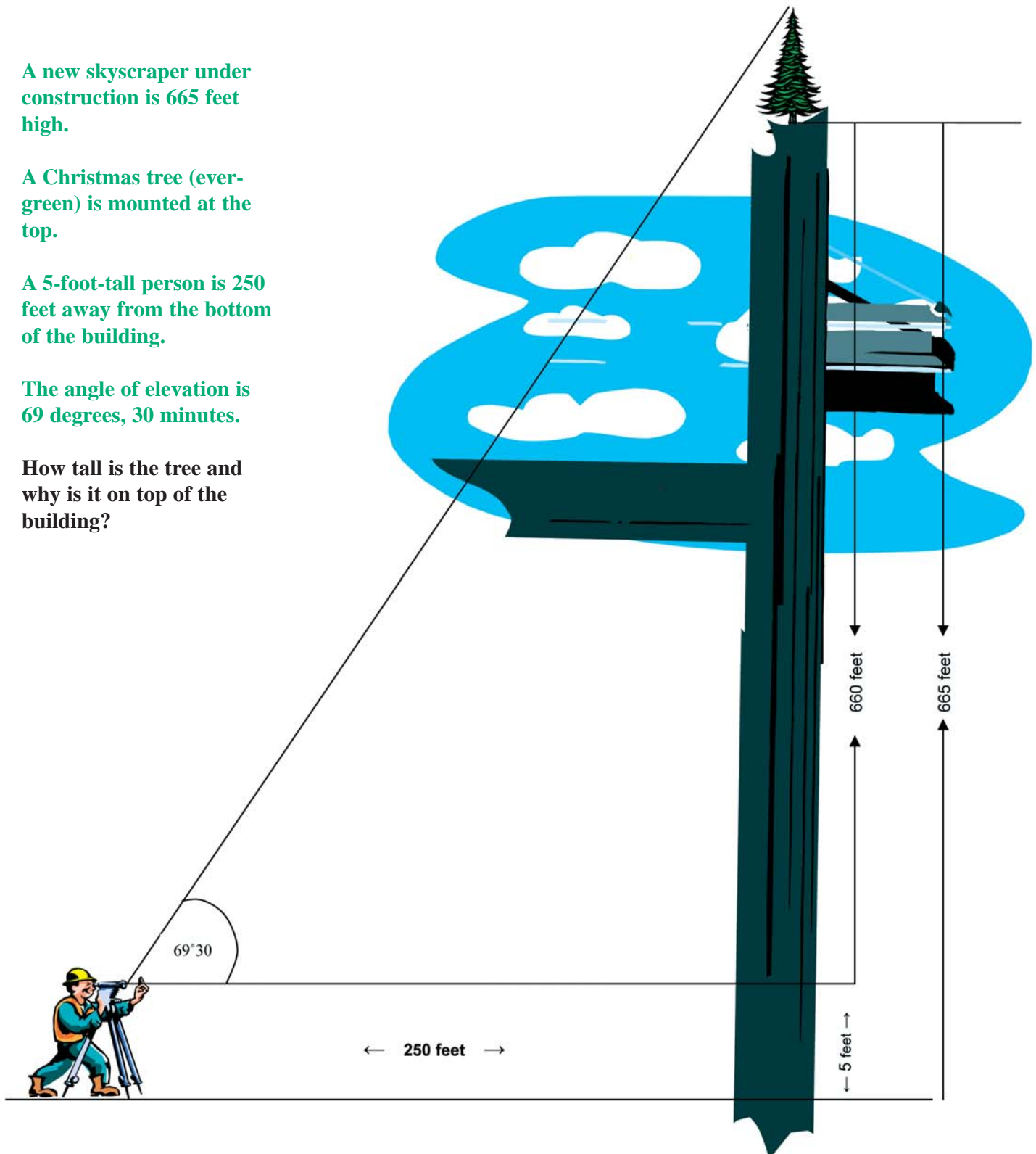
A new skyscraper under construction is 665 feet high.

A Christmas tree (ever-green) is mounted at the top.

A 5-foot-tall person is 250 feet away from the bottom of the building.

The angle of elevation is 69 degrees, 30 minutes.

How tall is the tree and why is it on top of the building?



## 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.

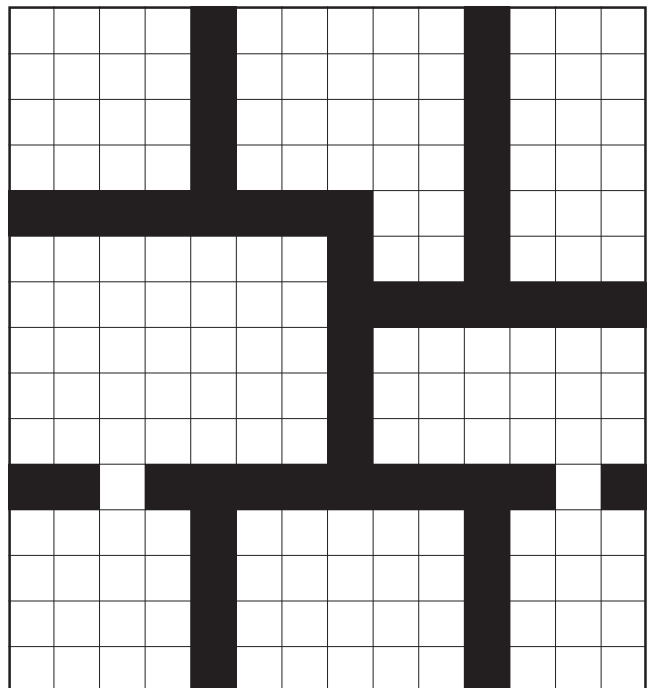
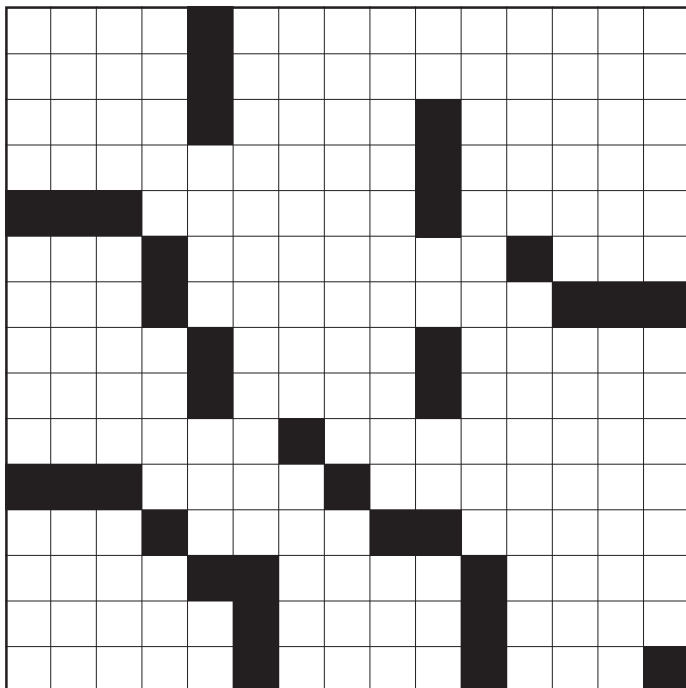
### NUMBER LIST – PUZZLE #1

<b>2 DIGITS</b>	1919	8471	82513	5347168
32	1987	8787	87653	
43	2352	8928	87659	<b>8 DIGITS</b>
98	2519	9139	98761	19765454
	2619	9542		54219898
	3219	9876	<b>6 DIGITS</b>	76458279
<b>3 DIGITS</b>	3219	9876	169387	93621893
121	3298		219837	
343	3463	<b>5 DIGITS</b>	219837	
457	3695	19898	765483	<b>9 DIGITS</b>
543	5454	25846	913958	219837654
568	5846	36957	987615	321876565
584	6796	36957		679625843
676	6954	54329	<b>7 DIGITS</b>	<b>10 DIGITS</b>
735	6957	65431	1473291	7165347168
781	7676	67962	3298767	8276458279
	7817	69381		
<b>4 DIGITS</b>	8431	71492		
1498	8431	78173		

**NOTE: We left out some of the really long ones just to make it a bit harder!**

### NUMBER LIST – PUZZLE #2

<b>2 DIGITS</b>	875	6569	54329	765483
24	928	7197	63535	817139
79	986	7213	68435	870594
		7216	76542	876595
<b>3 DIGITS</b>	<b>4 DIGITS</b>	7219	76542	928241
197	2121	7654	77639	
218	2197	7676	79540	<b>7 DIGITS</b>
218	2198	7677	79546	2654724
333	3219	8321	79646	3765835
563	3869	9397	81657	4876946
574	4321	9432	92768	5987157
574	4343	9876	98764	9432502
685	5453	9877		<b>8 DIGITS</b>
685	5566		<b>6 DIGITS</b>	43118783
685	6198	<b>5 DIGITS</b>	198726	
796	6199	19875	654372	<b>10 DIGITS</b>
817	6563	54320	685817	8765331919



PUZZLES BY HELEN

# December 2005

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Frosty, the snowman's "flakes":.>>>	Brian Gomez Dan Savage Jan King Whitney Barnes	Melinda Boudiette Helen Scheer Kate Jakobson Genene Warren	Anita Doud Jennifer Handrich Sarah Long Naomi Butler	(2005) <sup>0</sup>	Cube root of 8	Square root of 9
(50 %) (23)	$625^{(1/4)}$	$6((\sin X)^2 + (\cos X)^2)$	$(1/7)^{-1}$	16 COS( pi / 3)	Absolute value of negative 9	LOG (10 <sup>10</sup> )
$121^{(0.5)}$	$X + 3 = 15$	prime number between 11 and 17	sum of 3 and the square root of 121	product of 3 and 5	square root of $2^8$	$16 + 16/16$
Age to begin voting	consecutive odd integer after 17	A roll of ribbon has 20 yds. Each box takes 3 ft of ribbon. How many boxes can be wrapped?	lowest common multiple (LCM) of 7 and 3	10110 (binary)	CCLII - CCXXIX	One group of carolers goes to every 6th house. Another goes to every 8th. At which house will they meet?
HO HO HO	lowest common denominator (LCD) of 2 and 13	3 cubed	$(X - 28)(X + 32) = 0$ $X > 0$	$121 + 111$ (base 3)	negative 30 times (i) <sup>2</sup>	number of days in December

# FOOD FOR THOUGHT

## What's in a name!

The MATH newsletter has a new name, The Math Locus. The word *locus* is a Latin word meaning place or location. It is our hope that this newsletter finds a recreational and educational place in your life.

Locus is also a topic in both plane and solid geometry. In plane geometry, locus deals with a flat surface like your desk top. In solid geometry, locus deals with the space around you.

Locus is the path of a point which is described. The following are some locus problems. The solutions are found on the solution page.

Locus problem one:

What is the locus of all points in a plane that are equidistant from a given point?

Locus problem two:

What is the locus of all points in space that are equidistant from a given point?

Locus problem three:

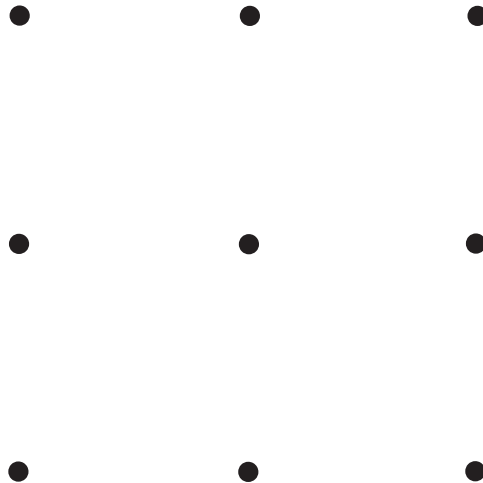
What is the locus of points in a plane equidistant from the sides of an acute angle?

Locus problem four:

If two planes intersect in space, what is the locus of points of intersection?

## Nine Dots

Here is an old puzzle and an easy one; nevertheless, it proves baffling to many a hasty reader. The diagram shows 9 dots in the form of a square. Draw 4 straight lines so as to cross out every dot. You must not cross any dot more than once, nor retrace any line, nor lift the pencil from the paper until all 9 dots have been crossed.



## YOUR AGE BY CHOCOLATE MATH

*Courtesy of Gene Frazier*

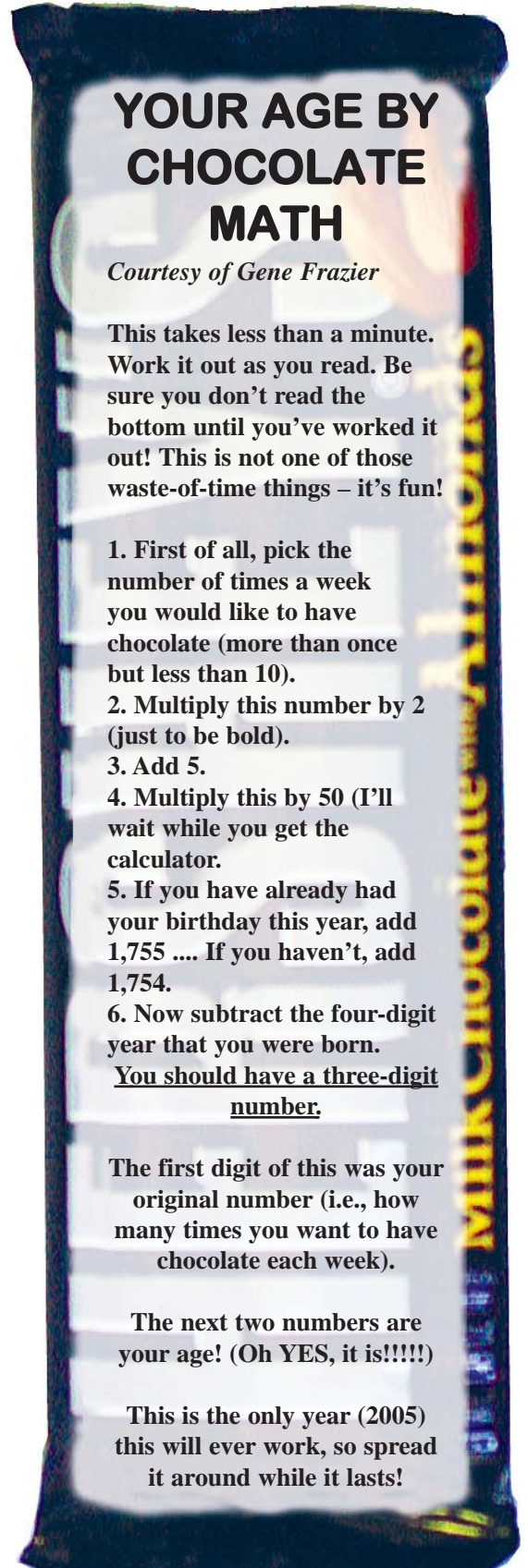
This takes less than a minute. Work it out as you read. Be sure you don't read the bottom until you've worked it out! This is not one of those waste-of-time things – it's fun!

1. First of all, pick the number of times a week you would like to have chocolate (more than once but less than 10).
  2. Multiply this number by 2 (just to be bold).
  3. Add 5.
  4. Multiply this by 50 (I'll wait while you get the calculator).
  5. If you have already had your birthday this year, add 1,755 .... If you haven't, add 1,754.
  6. Now subtract the four-digit year that you were born.
- You should have a three-digit number.

The first digit of this was your original number (i.e., how many times you want to have chocolate each week).

The next two numbers are your age! (Oh YES, it is!!!!)

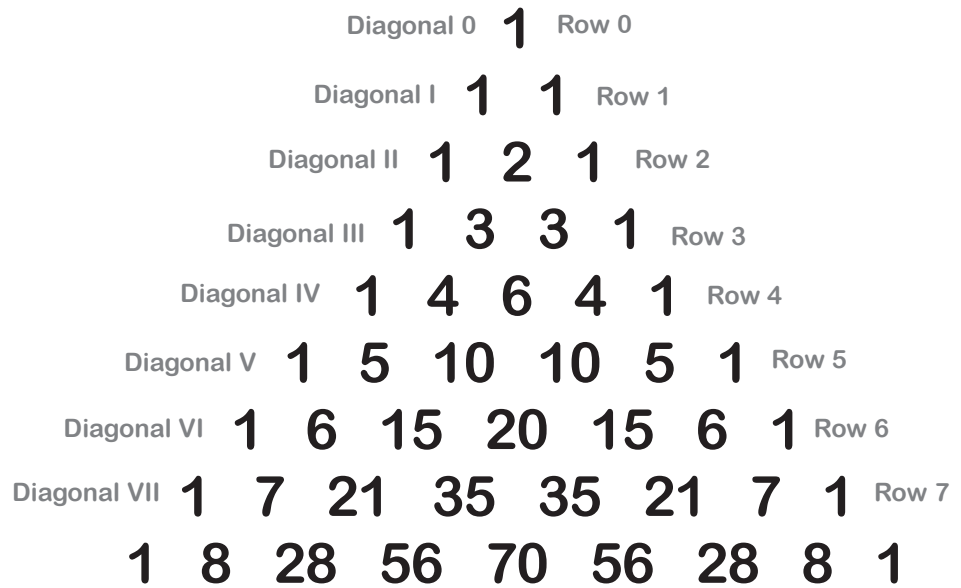
This is the only year (2005) this will ever work, so spread it around while it lasts!



# MATH GEEKS UNITE!

## The Pascal Triangle

The Pascal triangle houses a treasure of mathematical ideas which have been discovered over the centuries. Take a look at the different diagonals of numbers that appear in this triangular array. Notice that diagonal I is the most familiar sequence of numbers – the counting numbers. The numbers of diagonal II are called triangular numbers. When each number’s value is represented by dots, these dots form a triangle. Diagonal III is composed of tetrahedral numbers – the dots for these numbers form the 3-dimensional tetrahedron (i.e. triangular numbers brought into third dimension). Each successive diagonal’s numbers represent the next dimension.



The diagonal numbers also function as adding machines. Since the numbers of the Pascal triangle are generated by an addition process – each number is the sum of the two numbers straddling it in the row above – the triangle provides sums for the different diagonals. For example, the sum of the first seven counting numbers is given by the number below it in the triangular diagonal, namely 28

Another fascinating property of the Pascal triangle is how each row of numbers represents successive powers of 11. Row 0 has 1 which equals  $11^0$ . Row 1 has 1 1 which is  $11^1 = 11$ . Row 2 has 1 2 1 which is  $11^2 = 121$ . Row 3 has 1 3 3 1 which is  $11^3 = 1,331$ . Row 4 has 1 4 6 4 1 given by  $11^4 = 14,641$ . At first you think this property stops with row 5. But notice row 5 is the first row where two-digit numbers appear. Let’s see if  $11^5 = 161,051$  is hidden in this row. Think of row 5’s numbers as placevalue digits for base ten, then  $1(100,000s) + 5(10,000s) + 10(1,000s) + 5(10s) + 1(1s) = 161,051$ . Actually, this placevalue method holds true for all the previous rows, for example, row 4 numbers would be  $1(10,000s) + 4(1,000s) + 6(100s) + 4(10s) + 1(1) = 14,641$ . Why does this happen? Think of 11 as  $(10+1)$ . The numbers of the Pascal triangle represent the coefficients of the expansion of a binomial, for example  $(a+b)^4 = 1a^4 + 4a^3b + 6a^2b^2 + 4ab^3 + 1b^4$ . Let  $a=10$  and  $b=1$ , we get the following:  $(10+1)^4 = 1(10^4) + 4(10^3 \cdot 1) + 6(10^2 \cdot 1^2) + 4(10 \cdot 1^3) + (1^4) = 10,000 + 4(1,000) + 6(100) + 40 + 1 = 14,641$ .

## Secret Message!

9	1	9	3	7	2	Y	5	8	2	0	6	6	Y
2	5	4	3	D	Y	.	1	7					

**CLUES**

- H/A is undefined
- $U + E = W$
- Square root of (I) is H
- Square root of (E P) is L
- $(O)^H = H O$
- $(H)^T = U$

$$\begin{array}{r}
 \text{H E} \\
 \text{H I} \sqrt{\text{L U I}} \\
 \text{L P} \\
 \text{H I} \\
 \text{H I}
 \end{array}$$



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

0
1
2
3
4
5
6
7
8
9

## Christmas Tree Problem

$$\text{TAN } 69^{\circ}30' = X + 660$$

$$\frac{\quad}{250}$$

$$2.675 = X + 660$$

$$\frac{\quad}{250}$$

$$668.65 = X + 660$$

$$8.66 \text{ ft} = X \text{ or } 8 \text{ ft } 8 \text{ in}$$

### Why is the tree on top of the building?

The building of skyscrapers and high bridges is very dangerous for workmen. When bridges over rivers were built years ago, the local Indians would prove their bravery by walking on the beams high in the sky. Later they were hired to build skyscrapers. Often they would attach a tree at the very top as a sign of longevity and protection. Even today, observe closely at the time a new building goes up. See if you can spot an evergreen tree at the top. When the building is completed, the tree is removed.

## Locus Problems

Locus problem one:

CIRCLE with given point as center and equal distance is the radius.

Locus problem two:

SPHERE with given point as center and equal distance is the radius.

Locus problem three:

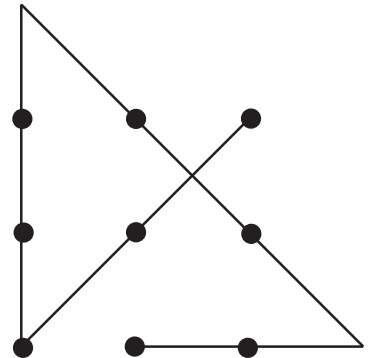
A LINE which is the angle bisector.

Locus problem four:

A LINE is generated by the intersection. (This is similar to two walls meeting in the corner.)

## Nine Dots

The solution is shown. Hasty readers are apt to reject this solution, once they have found it, because the horizontal line if extended would cross the dot in the lower left corner a second time. But nothing in the statement of the problem implies that the line must be construed as infinite in length. On the contrary, the stipulation that the pencil must not be lifted implies that we are dealing with finite line segments.



## NUMBER FILL-INS

#1

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

#2

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

## Secret Message

We wish you happy holidays!

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/the-mathlocus>

## About Us

**Continued from front page** process. AQIP is an alternative self-evaluation method offered by the North Central Association and one of its criteria deals with understanding student's and other stakeholders' needs. KCC's Mathematics and Tutoring departments have a vested interest in these needs and a unique opportunity to observe them on a personal level with the students who are more likely to share in a one-on-one relationship.

The stakeholders can be any of the following: individual students, their families, employers and businesses, the local communities, and Kirtland Community College itself. When a decision is made to come to KCC, there is hope for a better future for one's self and family. Businesses which choose Michigan for their location have a right to expect employees who have proper training and skills. Sources of financial aid expect a positive result from their investment. Sacrifices are made by families and individuals. They expect to have their dreams come true. In many cases, this is the first time a family has been able to try to make this happen.

But when a student has a problem with math and drop-

**For a course or a career, check out Kirtland Community College!**  
**www.kirtland.edu**  
 10775 N. St. Helen Road  
 Roscommon, MI 48653

ping out becomes a choice, some are wise enough to choose tutoring as a lifeline. Mathematics and English seem to be the areas requiring the most help. In particular, math – which is needed for so many areas, including technical, science, computers and medicine – is the course that often makes or breaks a student.

In the Sunday, Oct 23, 2005, issue of the Detroit News, there was an extensive article that covered the front page and continued through several other pages. Its headline read MAKING MATH COUNT. This article said it all. We are all stakeholders of the future.

The Tutoring Center is committed to helping students with their classes, study and learning skills, and issues such as test anxiety, and to share in their successes, growth in self-confidence and self-esteem.

Math is top priority at Kirtland Community College in its curriculum and tutoring center.

As we evaluate ourselves, we had better be making the grade.

## 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.

## Jones

**Continued from page 1** for that.”

Jones passed away Saturday, Nov. 12, leaving behind his wife, Pam, five children, eight grandchildren and countless friends, students and acquaintances who he had taught and inspired through his many endeavors at Kirtland and in the community.

Ginna Wenger, an instructor at Kirtland, was a longtime friend of Will Jones.

“He didn’t want people dressing up and mourning,” Wenger said prior to Jones’ memorial service. “It’s going to be kind of a party, because that’s how he would have wanted it.”

Wenger and Jones met years ago at Kirtland.

“He was a single dad, and I was a single mom for a lot of years. He was always very helpful to me,” she said.

Whenever anything at Wenger’s home needed repairs, Jones, a consummate handyman, jumped in to fix it.

“He was one of those guys who was always willing to be there,” Wenger said. “He was one of those guys who would do anything for anybody.”

Wenger said Jones was also a great friend to her daughter, Bethany Rickwald.

“They just had a really neat relationship,” Wenger said.

When Will and Pam Jones were married in December 2003, Bethany served as Will’s “best man.”

“And she was 15 years old at the time,” Wenger said.

Through his many interests, Jones was able to affect many people in the community, Wenger said.

In addition to tutoring mathematics for Kirtland and running the Book Worm used book store in Roscommon, Jones coordinated a chess club and was a founder and longtime referee for the youth soccer program in Roscommon. He also volunteered at the Second Chance Academy, teaching troubled youths to play chess.

“He did so many different things,” Wenger said. “He was kind of a renaissance man.

“Will was a great friend. He will be missed,” she said.

– *This story was reprinted by permission from the Nov. 20, 2005, issue of the Roscommon County Herald-News. Tony Root is the editor.*

**Did you know – an acre of young growing trees consumes an average of six tons of carbon dioxide and gives off four tons of fresh oxygen per year?**

### Try this one for good measure!

From a deck of cards remove four aces, four deuces, four threes and four fours. Arrange them into four rows and columns, so that in each row, column or diagonal of four cards, no same suit, or card value appears more than once.