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THE MATH LOCUS

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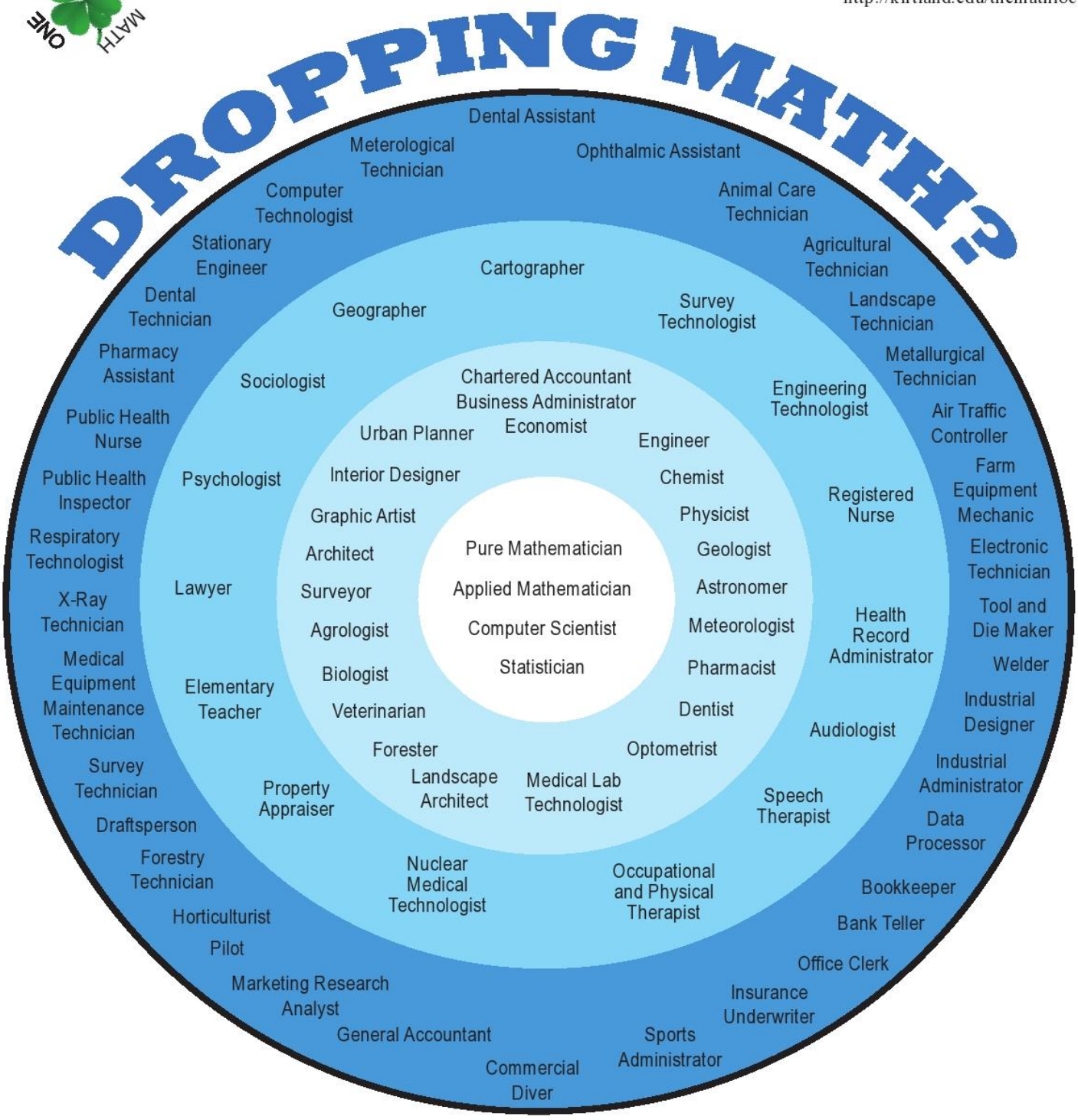


Say Good-bye to 100+ Jobs

Biographies of Women Mathematicians

Carol Karp

August 10, 1926 - August 20, 1972

Carol Ruth Vander Velde was born in Forest Grove, Michigan, part of the Dutch farming community near Holland, Michigan. She attended school there and in Ohio where her family moved when she was 11. She graduated with distinction from Manchester College, Indiana, in 1948, and then earned a master's degree in mathematics from Michigan State University in 1950. Before entering the graduate program in mathematics at the University of Southern California in 1951, she spent time as a violist in a touring all-woman orchestra.

During her first year at USC, Carol married Arthur Karp. During the next 8 years she pursued her graduate studies while following her thesis advisor, Leon Henkin, and her husband around the country and the world. She spent two years at the University of California at Berkeley and parts of the years 1957 and 1958 in Japan where her husband was stationed in the Navy. In 1958 she accepted a position at the University of Maryland. Karp finally received her Ph.D. from the University of Southern California in 1959 with a dissertation on "Languages with expressions of infinite length"

Karp spent her entire career at the University of Maryland, reaching the rank of professor only 7 years after earning her Ph.D. She was a highly respected member of the international logic community and a leader in the developing theory of infinitary logic. Her book *Languages with Expressions of Infinite Length* was one of her most important contributions to this area. She was instrumental in the growth of the mathematical logic group in the mathematics department at Maryland and supervised four Ph.D. students in logic. She was a consulting editor of the Journal of Symbolic Logic and an active member of her department until her death from breast cancer at the age of 46. Lopez-Escobar, a colleague at the University of Maryland, writes [3]:

Carol Karp died...after a brave battle against cancer which had lasted for three long years. To her, teaching had always been more than a duty, and even during her illness she taught all her classes in addition to carrying out her administrative tasks. Her research, too, was pushed forward with her usual determination, but unfortunately the planned new monograph on infinitary languages remained unfinished. Her early work was collected in her one published book, but she realized that it very much need to be brought up to date.

Towards the end she was rather apprehensive that her doctoral students would not be able to complete their studies; but her fears were unfounded: they all now have their Ph.D. degrees...To them as to us the memory of the conduct of her life, exceptional spirit and warm personality persists as a lasting inspiration.

(With permission from Larry Riddle of St. Agnes College)

About us

The Drop-In Math Lab is in a new location, has a new look and new leader. Deb Shumaker is the Library and Tutoring Director. She wears her many hats very well; one of which was coordinating the new location of math tutoring in the library area. Helen Scheer is the Lead Math Tutor and also KCC Math instructor. Helen and Deb worked together to form a comfortable and high-tech environment for the students to work in. Also there are peer students to help with one-on-one math tutoring: Matt Bolinger, Shane Short, Zachary Berlin, Iryna Riegle, and Jaqueline Tyler. We would like to thank the peer tutors in their Service Learning contribution to their fellow students who need help. Each semester we are looking for more qualified peer tutors. Erinne Baughn is another Math instructor who helped with Math tutoring. Math Tutoring is a very important aid in minimizing ***math drop-outs***.

Here are some statistics about the Math Drop-In Lab for the fall of 2011. There were 101 students who walked through our doors for help and there were over 800 hours of tutoring. The breakdown for courses are as follows: Basic Math (MTH 063) had 31 students; Basic Algebra (MTH 073) had 24 students; Intermediate Algebra had 33 students; there were 9 students from College Algebra (MTH 130) and the rest were a combination of Pre-calculus, Math for Meds, and Math for teachers.

E-Learning

Kirtland's E-Learning department offers several venues to assist students in being successful and minimize their travel time. First, there are courses which meet only on-line. Students and teachers do not meet face-to-face. Some exams might be in the testing center on campus. These courses have the number 60 at the end. Secondly, there are hybrid courses which are a combination of on-line and on-campus location with some face-to-face time. These courses have the number 80 at the end. Then there is the Web Enhanced course where some work is completed on-campus , but other work is completed on-line.

This Winter 2012 semester the math department is offering two Hybrid courses. Erinne Baughn is teaching Basic Algebra (MTH 073), using a new book by Hawks Learning Systems: (hawkeslearning.com). All homework and testing can be done on a computer at home or in the library. The class will meet about nine times on-campus. Erinne will be available on-campus for help. Also Marcell Romancky will be teaching Intermediate Algebra (MTH 120) using the same publisher and system. The ladies are cohorts and are a part of a new grant.

Mathematics Sequence Chart
Effective Winter 2012

MTH 06300
Basic Math

MTH 07300
Basic Algebra

MTH 07400
Basic Algebra Lab

MTH 12000
Intermediate Algebra

MTH 18001
Precalculus

MTH 13000
College Algebra

MTH 11700
Math for Elementary Teachers I

MTH 20600
Into to Statistics with App.

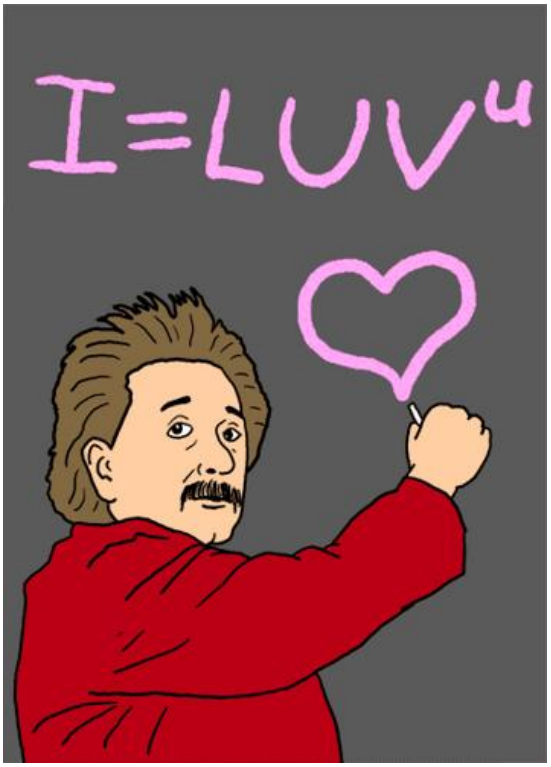
MTH 22002
Calculus I

MTH 21700
Math for Elementary Teachers II

MTH 22102
Calculus II

MTH 22202
Calculus III

MTH 23000
Differential Equations



Notes from Marcell Romancky, Mathematics Department Chair

I am pleased to write to you about one of the busiest departments on campus! This semester there is pilot project in full swing. Erinne Baughn, Doug Mace and I are piloting the Hawkes Learning System for Basic Algebra and Intermediate Algebra. The system allows students to use computer programs to do their homework long with computer support for all lessons. Two Hybrid classes, Intermediate Algebra on Tuesday and Basic Algebra on Wednesdays, are classes that meet once a week to go over homework questions and provide instructor support for students are there to provide students with a classroom experience. The online Intermediate Algebra course is for students do most of the work on their own with online support from their instructor. This is a new experience for me. If the pilot project is a success, in the Fall 2012 semester all MTH 07300 sections will use Hawkes Learning Systems and in Winter 2013 Intermediate Algebra will be added using it as well. Don't worry most of the courses will be on campus which meet twice a week. Hybrid and online will also be offered. If you have one of the pilot classes, please let me know your thoughts at marcell.romancky@kirtland.edu. It is important to have student feedback.

Besides the pilot project, the department is working on providing high schools with an option to send their students to campus to take a Calculus I course. Students would receive college credit for the course and would be able to take Calculus II in the winter semester. All schools, in the Kirtland district, will receive a letter from the Math Department about the time when the course is offered. If you have comments on this, please send them to Kevin Baughn at kevin.baughn@kirtland.edu.

With new programs of study to be offered on campus and the lowering of credits in Associates in Applied Arts degrees, the math department will investigate offering a math course that relates to the field of study that you will be completing. If the other departments need this course, the math department will work on developing this course.

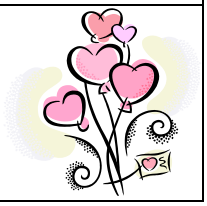
Our "drop-in" math tutoring is working well. The program is in the Library and is open 4 days a week. Check it out this semester. We also always need tutors, please see your instructor from last semester to fill out a recommendation form that you get from the Library if you would like to fill one of these tutoring spots. So give it some thought. If you need tutoring, please stop in the Library and fill out your paper work. Tutoring helps most students who take advantage of it.

Please let me know your thoughts on your math courses at Kirtland. My door is open in Office 23 in the Instruction Center (INS). Please stop by.

MATH WORD SEARCH

M W E F D G H T K L D U A U L Y J P C S D I L I T A D U J A A B V T G G H E I R R P V I I R X W Q F U T E Q D P O P L U S O B W A E L U N J A G K U S Z R Y P P L L I D S D B G F R A C T I O N R H W Y J K O T N E C R E P	ADD SUBTRACT MULTIPLY DIVIDE HALF PLUS EQUAL GROUP FRACTION PERCENT

February 2012

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			Ten million ^ zero	***Binary Base***	**3 (SIN^2+COS^2)**	**How many sides in a square?**
Pentagon has how many sides?	**Half a dozen**	**Y = 7 X + 21 What is the slope?**	**Square of what number is 64?**	**A cat has how many lives?**	**How many digits do you have on two hands?**	**Y-intercept of $Y = X^2 + X + 11$**
In a right triangle A = 78° B = ? C = 90°	**"Unlucky number"**		**(225) ^ (1/2)**	**Two raised to the fourth**	**Odd number between 16 and 18**	**Composite number whose factors are 3, 3, and 2**
Cube root of 6859	**How many digits do you have on two hands and two feet?**	**One Month until Spring**	**Complement of a 68° angle?**	**Round 22.59 to whole number**	**$6 * 2^2$**	**Ten months from today is Christmas**
Twice a baker's dozen	**Three cubed**	**Last day of the month 3 out of 4 years**	**Two times a number is 58. What is the number?**			

This is an unbelievable MATH problem!

Here is a math trick so unbelievable that it will stump you! Grab a calculator (you won't be able to do this one in your head!).

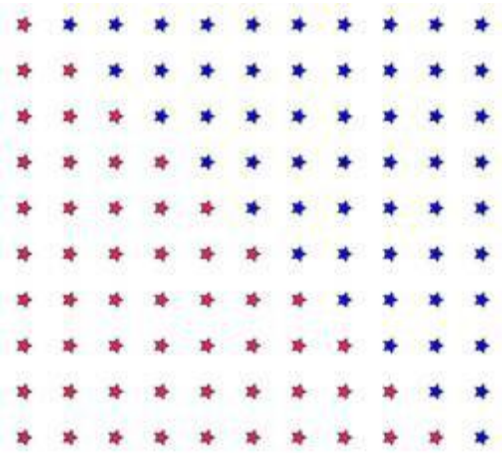
1. Key in the first three digits of your phone number (**NOT** the area code)
2. Multiply by 80
3. Add 1
4. Multiply by 250
5. Add the last 4 digits of your phone number
6. Add the last 4 digits of your phone number again
7. Subtract 250
8. Divide number by 2

Do you recognize the answer?

MORE PUZZLES

Adding Up Numbers

by Helen Wong



1. The picture at right has red and blue stars arranged in 10 rows and 11 columns. How many red stars are there in each row? Can you see how it can be used to explain Gauss' trick to show that 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = ½ (10)(11)?

2. All together, the seven Harry Potter books contain a total of 4100 pages. Amy is an incredibly gifted girl (and extremely quick at reading), but it takes her a while to get hooked onto the books.
The first night, she reads only the first page. The second night, she is a bit more interested and manages to read the next two pages. The third night, she starts where she left off and reads the next three pages. She continues this way, so that on the *n*th night, she reads *n* new pages. What page will she be on at the end of one week? How long will it take her to finish all seven books?

3. Jo wants to collect Silly Bandz. She and her aunt have struck a deal. For the first week that Jo gets an A in class, her aunt will give her one new bracelet. If Jo keeps up her A for a second week, her aunt will give her two new bracelets at the end of the second week. If Jo keeps it up for three weeks in a row, her aunt will give her four new bracelets at the end of the third week. Because Jo's aunt worries that Jo will forget about their deal, she writes down her promise using a chart:

Week	New bracelets
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128
9	256
10	512

Week	Total bracelets
1	1
2	3
3	7
4	15
5	
6	
7	
8	
9	
10	

Help Jo and her aunt fill in the chart for the total bracelets! Is there a pattern? Can you find a formula?

Our email is:
tutoring@kirtland.edu

TUTORING SERVICES
Located in the Library
989·275·5000 x 246
HOURS:
Monday – Thursday
8 a.m. – 8 p.m.
Friday
8 a.m. – 4:30 p.m.

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Solutions

1. There is 1 red star in the first row, 2 in the second, 3 in the third, and so on. Thus, the total number of red stars in the figure is equal to $1 + 2 + 3 + \ldots + 10$. The number of blue stars in the diagram is the same as the number of red stars, and together, all the stars form a 10 by 11 rectangular arrangement. Such a rectangular arrangement has 10×11 total stars, so the number of red stars must be half of this. Thus, $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = \frac{1}{2}\ (10)(11)$.

2. At the end of n days, she will have just finished reading page number $1 + 2 + 3 + \ldots + n$. Since there are 7 days in a week, at the end of a week, she will have just finished reading page number $1 + 2 + 3 + \ldots + 7 = 0.5(7)(8) = 28$.
To figure out how long it will take her to read all seven books, we have to find the smallest integer n such that $1 + 2 + 3 + \ldots + n \geq 4100$. In other words, for what n is $\frac{n(n+1)}{2} \geq 4100$?
Multiplying both sides by 2, this becomes $n(n + 1) \geq 8200$. If you know the quadratic formula, you can use that to get at the answer directly. But if you don't, you might reason that $n(n + 1)$ is roughly n^2 and the square root of 8200 is about 90. This will be too small, but it will be close to the correct answer. We compute $90(91) = 8190$ and $91(92) = 8372$. So the answer is that on the 91st day, she will have finished all seven Harry Potter books.

3. Here's the chart filled in:

Week	New bracelets
1	1
2	2
3	4
4	8
5	16
6	32
7	64
8	128
9	256
10	512

Week	Total bracelets
1	1
2	3
3	7
4	15
5	31
6	63
7	127
8	255
9	511
10	1023

Notice that if you add one to every entry in the "Total bracelets" column, you get the entries in the "New bracelets" column, only shifted by one row.

The "New bracelets" column lists the powers of 2. The entry in the nth row is $2n - 1$. Therefore, the entry in the nth row of the "Total bracelets" column is $2n - 1$.

To prove this rigorously, you have to show that $1 + 2 + 22 + \ldots + 2n - 1 = 2n - 1$. There are many ways to do this. One way is to interpret it as a binary addition problem.