



Credit
Humber
Association for
Mathematics
Promotion

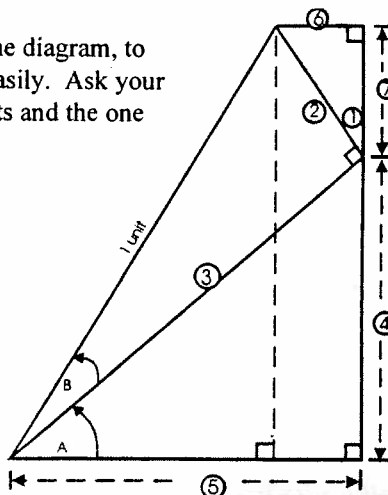
CHAMP News

Volume #1 Issue # 3
Spring 1997

CHAMP is an association for Mathematics Teachers of Halton, Peel, Etobicoke and Dufferin Peel.

Uncomplicated Compound Angles By Norm Wilkie

It is possible to use basic trigonometric definitions, and the diagram, to develop the formulae for $\sin(A+B)$ and $\cos(A+B)$ quickly and easily. Ask your students to find expressions for each of the numbered line segments and the one angle.



1. This angle is equal to A
(180 degrees in the line and in the triangle)
2. ② over the hypotenuse of one unit is $\sin B$
3. ③ over the hypotenuse of one unit is $\cos B$
4. ④ over ③ = $\sin A$. Therefore ④ = $\sin A \cos B$
5. ⑤ over ③ = $\cos A$. Therefore ⑤ = $\cos A \cos B$
6. ⑥ over ② = $\sin A$. Therefore ⑥ = $\sin A \sin B$
7. ⑦ over ② = $\cos A$. Therefore ⑦ = $\cos A \sin B$

$$\text{④} + \text{⑦} = \sin(A+B) \quad \sin(A+B) = \sin A \cos B + \cos A \sin B$$

$$\text{⑤} - \text{⑥} = \cos(A+B) \quad \cos(A+B) = \cos A \cos B - \sin A \sin B$$

It follows that $\sin(A+(-B)) = \sin A \cos(-B) + \cos A \sin(-B)$

$$\sin(A-B) = \sin A \cos B - \cos A \sin B$$

Furthermore, $\cos(A+(-B)) = \cos A \cos(-B) - \sin A \sin(-B)$

$$\cos(A-B) = \cos A \cos B + \sin A \sin B$$

In this Issue

Six Trix
Oame 97
Taking Our Chances
Paper Folding
Software Review
Puzzles to Ponder
Overhead Math Tips
and more.....

EDITORIAL

By Jeff Irvine

We made it! This is the third (and last of the year) issue of the inaugural year of the CHAMP News. I hope you have enjoyed our three newsletters and found something to try in your classroom. The articles in each issue were contributed by teachers working in Peel, Halton, and Dufferin-Peel. As editor I was impressed by the quality and feasibility of the ideas expressed. This has confirmed a thought expressed by the CHAMP Executive that every teacher has at least one strategy/problem/activity/worksheet which works well in the classroom, and which is worth sharing with others through a P.D. Forum such as this newsletter. CHAMP News plans to publish three issues again next year. We need each of you to take a few minutes to get one of your excellent teaching ideas into a form which will allow it to be shared with other teachers through CHAMP News. Please send your articles to Marlene Dewey at Clarkson Secondary School. [If you really get into this, feel free to send Marlene two or three articles!] If you have an idea for a regular column in CHAMP News contact Marlene.

We've just come through a really interesting year in Math

education. The Grade Three Testing results are not yet available, but the process/event certainly gave rise to a lot of discussion. Stories of students in tears and teachers in tears were balanced with stories of students asking "Can we do this all year" and comments like "This math is really fun"; "Wow! Math can be used for lots of different things"; "My mom says she wishes math was like this when she was in school". At the very least, the Grade Three Testing forced everyone involved to take a critical look at their own Mathematics teaching. I think the results will show that much of what we do we do very well [and probably that some of what we do needs rethinking].

At the Secondary level, the hot topic of the year was Secondary School Reform. Characterized mainly by a dearth of information at the classroom level, this (probably/possibly) radical change provides an opportunity for significant change, the likes of which I haven't seen in my 24 years in teaching. OAME has been very active in making recommendations on the direction and content of secondary school Mathematics education. Through your

membership in CHAMP and OAME you have the opportunity to not only express an opinion, but to have that opinion heard by the members of OAME, the Ministry of Education, and the Government of Ontario.

Due to the realignment of school boards in Ontario, the member boards of CHAMP will be undergoing some changes. We welcome as a member board the Halton Roman Catholic Board of Education. Halton RCSSB will be replacing the Etobicoke Board of Education, which will become part of the Toronto "megaboard". I hope the teachers in Halton RCSSB benefit from CHAMP membership. We welcome the sharing of their contributions to Math education in our region.

CHAMP will continue to provide PD opportunities for teachers in our region, and to provide a voice for your views on mathematics education in the province.

Have a terrific summer. Look for the next issue of CHAMP News in October. Contributing articles should be sent to Marlene by September 28.

CHAMP News

Editors: Marlene Dewey, Jeff Irvine

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How do *your* students view Mathematics?

by Sue Trew

A consultant with the Dufferin-Peel RCSS Board

As teachers we work hard to try to give our students the best opportunities for learning Mathematics and, if we use marks to measure success, some of our students are indeed successful. But what impression of Mathematics do these successful Math students have by the time they reach grade 12? The following informal discussion (debate) of Mathematics by three grade 12 students, two of whom are "identified" high achievers in mathematics, actually took place during lunch in a Mississauga High School cafeteria.

Student A: "I think I'm going to study Arts & Literature when I go to university."

Student B: "All the free-thinkers seem to specialize in Arts."

Student C: "That's because you can't be creative in things like Math."

Student B: "Why can't Math be taught like an English class? You know, let people have a chance to express their thoughts and ideas and have discussions and not sit in

rows!
Discussions in Math class are always dominated by the teacher!"

Student A: "But Math is just a mechanical process for solving problems. It's not a subject you can teach that way."

Student C: "Yeah. You just go to class to learn techniques and to perfect them."

Student B: "Why can't you develop your own methods and techniques for solving problems? Why should we settle for a method that was devised hundreds of years ago? Maybe there's a better way!"

Student A: "That would take too long. You wouldn't progress or move in Math at the rate we go now."

Student C: "Anyway, kids aren't smart enough to do that!"

Student B: "How do you know if you don't give them a chance?"

It's too late for us but they should start at an early age. Make sure kids understand why $1+1=2$ and don't just memorize it!

What's more important, memorizing techniques or learning how to learn? In the real world you may not have a set type of problem to solve."

Student A went home that night and chatted to his dad, a nuclear engineer who develops safety systems for nuclear reactors. His dad took the time to show him some of the problems he has solved. He now agrees with student B.

None of these students plans to take math courses after high school.

With Secondary School Reform under discussion we have the opportunity to change the way we do things in math class. What changes do *you* feel we should be making? Write and tell us!

CHAMP members hard at work at OAME 97



SIX TRIX

By P. Gill Dunn

Six Trix is a very simple game to play as a one-player game. As a two-player game, I have not been able to exhaust all the strategies. (This game has remained with me over 32 years that I've been a teacher.)

ONE PLAYER GAME:

You need a 3 by 3 square grid consisting of 9 squares and the numbers 1, 1, 1, 2, 2, 2, 3, 3, 3. The object of this game is to find as many ways to place the numbers on the 3 by 3 square grid so that the sum of the three numbers is six.

It is quite interesting how different students approach this puzzle. When I have seen a student set up the problem this way (figure 1), I'll ask that student how many different ways does (s)he see that totals six? Often a response will be four ways and this is where I interject that I see two other ways. Now the student realizes that the diagonal is also another possibility. Another interesting observation is when a student can only get seven ways of doing this puzzle and knows that there is an 8th way. (ie. fig 2 and fig. 3).

1	2	3
1	2	3
1	2	3

(figure 1)

2	3	1
3	1	2
1	2	3

(figure 2)

2	1	3
1	3	2
3	2	1

(figure 3)

Without giving the answer away, I'll suggest changing the center number. Only when (s)he has found all eight ways will I then explain

the rules for the two player game. A student who only knows seven ways will be at a disadvantage when (s)he plays another student who knows the maximum number of ways of obtaining six.

TWO PLAYER GAME:

Before I explain this 2 player game, let me digress for a moment. This puzzle began with the language arts curriculum. In my grade 5 class there was a very bright Italian boy (Montreal 1964) who caught onto this game very quickly when he played me. He had to write the instructions for the single game. Next he wrote 5 or 6 rules for the two-player game so that any other student from the class of 34 boys could read his instructions, solve the puzzle and then be able to play him in the 2 player game. This proved to be quite a challenge for "Mario" to improve his writing skills in his second language.

This is how the two player game is played: Each player receives the numbers 1,2,3. The remaining numbers (1,2,3) are turned face down and shuffled. Each player now selects one of the numbers and the remaining face down number is turned over and placed in the center of the 3 by 3 grid. The player who has just picked the largest number that was face down has the option of going first or second. The game begins by the first player playing one of his/her numbers on the 3 by 3 grid. A point is scored as soon as 3 of these numbers add up to six. Each player takes a turn in placing his/her numbers in one of the empty squares remaining. Round 1 concludes with all the numbers have been played. Now the numbers are removed from the board and Round 2 begins. It is the same procedure as round 1 except for one condition. Whoever went first in round 1 now goes second. The game continues for several rounds with each player alternating going first until one

of the players scores 15 points. Originally the game ended at 10 points but I extended it to 15 in order to allow for better strategies to work within the game. (I'm still not sure if 15 is the best number to decide the winner.)

It should be noted here that when you score points in this game you can sometimes allow your opponent to score 1 point while you score 2 points. For

1	2	
2	3	
3	1	2

(figure 4)

example, fig.4. If player A puts his 1 in the 3rd column 2nd row and scores a point, player B places his 3 in the upper right corner and scores 2 points.

Some students may not have any success winning at this game because they need to learn a defensive strategy, especially when they have to go first. Here is an opportunity for these students to be exposed to some fun "mathematical research". I would ask them to revisit the single player game and now investigate the minimum number of ways you can

2	3	3
1	3	2
1	1	2

(Figure 5)

score six. For example in fig. 5 there is only one way in which the sum of the three numbers adds up to six. Now have them go back and challenge their opponent using this strategy and see if the results are any different. (I never had a chance to use this technique with a whole class to see if it really helps the weaker student - I would appreciate some feedback here.)

It would be very easy to set up a class tournament where an eventual class champion would be declared the overall

winner. All students could be invited to write down the strategies that they used in the tournament and share their information in a collaborative setting. The obvious extension to this game would be a 4 player game.

FOUR PLAYER GAME:

(This has not been tested to date)

With the new emphasis on communication in Mathematics, I can see this SIX TRIX game as being a rich learning experience when the players of a 2 player game co-operate to become a team that then devises a strategy against another 2 player team. Is this not collaboration at it's best?

Here are some possible questions that you might overhear these 2 player teams discussing:

- 1) Is there an advantage to going first or second in the game?
- 2) When should you play offensively or defensively?
- 3) Does the number 1, 2 or 3 placed in the center square change the outcome of the round?
- 4) Can I set up my opponent where (s)he scores one point but I score 2 points?
- 5) What is the best way to keep track of all the possible outcomes of the game in order to improve a strategy?
- 6) What is the maximum or minimum number of rounds needed to win the game?

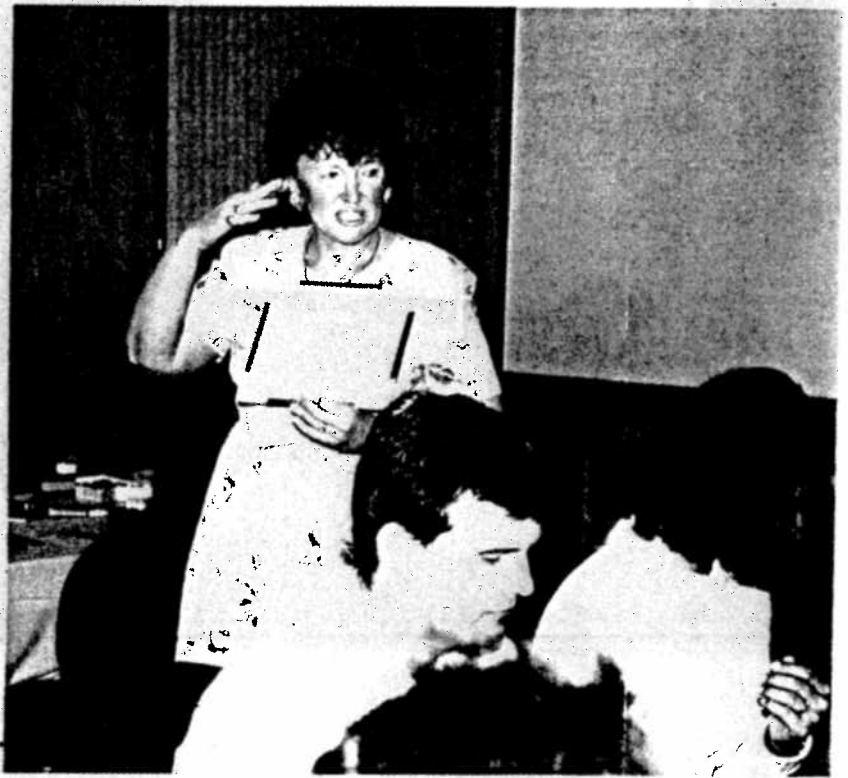
As you can see, this 4 player game has so much potential in making Mathematics come ALIVE ! I would appreciate hearing from you if you catch the SIX TRIX bug. My fax # is (905) 846-2625 and my school address is:

Notre Dame S.S.
2 Notre Dame Ave.
Brampton, ON
L6Z 4L5

Happy six trixing!!!



Marg Warren responds to another Math Co-ordinator's comments at OAME 97.



Carol Danbrook was her usual enthusiastic self during a presentation at OAME 97.

OAME '97

“ The Name of the Game ”

On May 7 - 10 the Annual Provincial Conference of the Ontario Association for Mathematics Education was held in Toronto at the Sheraton Centre. Over 1200 math educators took part in three days of workshops and PD sessions. CHAMP members were very active at this conference. When not enjoying a chance to relax and chat in the CHAMP Hospitality Suite, many CHAMP members were busy as session leaders.

Among our members who presented workshops in Toronto were:

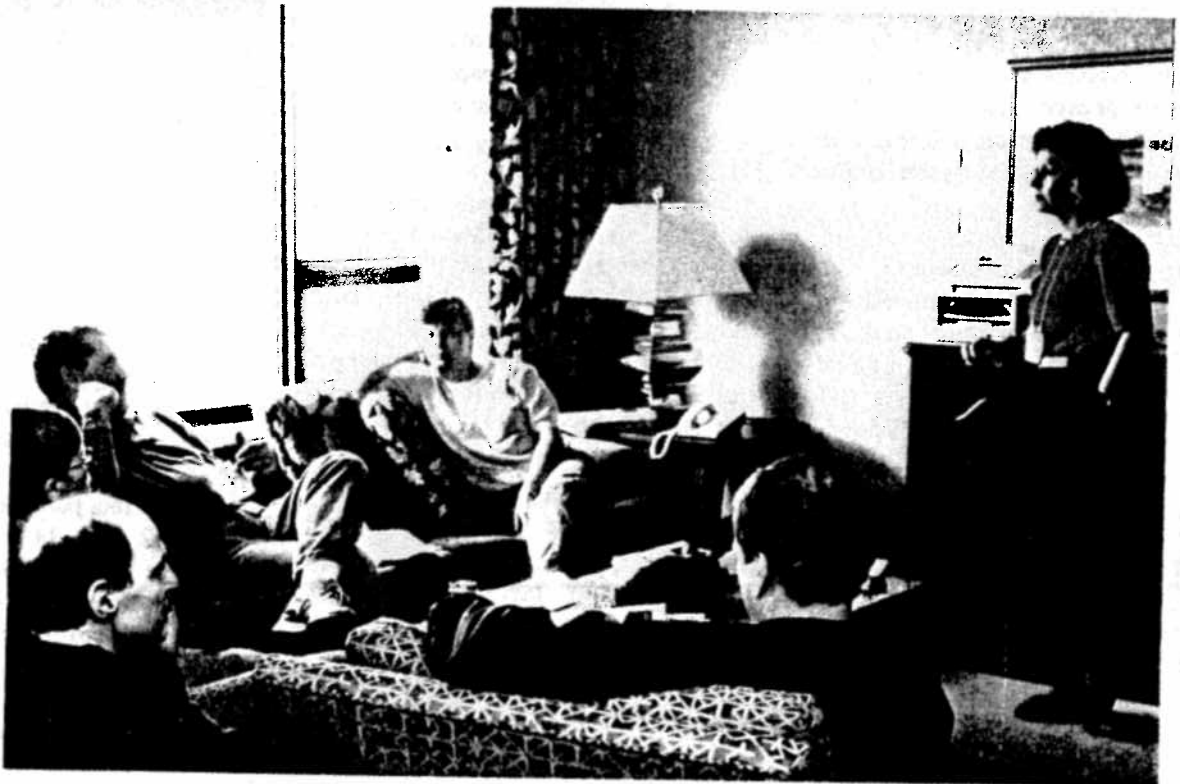
Carol Danbrook	Sharon Morris
Janet Giberson	Anne Muller
Jeff Irvine	Marg Warren
Dwight Klassen	Mike Wierzba
Gerry Mielke	Dave Zimmer





CHAMP Hospitality Suite

Relaxing after a hard day of sessions.



Taking our chances with **PROBABILITY** in the classroom

By Anne Muller, Lisgar P.S.

Probability is a concept we have rarely tackled in the elementary classroom and yet we are all confronted with it in our daily lives. And although they can't articulate it, even young children know events occur on the judgment of certain probabilities or chance:

Will it rain? Do I need my umbrella? Should I take my ball and glove to school? Will we play catch? Will it be indoor or outdoor recess today? This always happens to me! Where are they? They should be here by now! I'll save my money until it goes on sale! Why bother entering the contest?

In this age of information and technology more statistical information is available to us than ever before and we have to make predictions and decisions based on that information. Our students need to develop skills, at a young age, that will enable them to be confident and sensible problem solvers—not misled by statistics, or even worse—afraid of them! Probability experiences will help them to learn how to become better informed decision-makers.

Increased attention to Data Management and Probability in the classroom provides authentic and meaningful contexts for students to develop and apply skills in estimation and computation, as well as critical thinking (ie., drawing conclusions and making justifications based on the numerical information collected and analyzed.) This strand also provides a strong connection between school Mathematics and the real world. Probability is fundamental to decisions made in a number of fields, such as business, research, insurance, medicine, and politics. In our personal lives, we are faced with it in matters of parenting, health, weather, employment, finances

and sports.

Probability activities generate high interest and involvement due to the uncertainty of the outcome which compels students to want to know what will happen. Data management and Probability activities in the elementary classroom should be informal and relevant to the interests of the students. They should help students develop skills in making predictions, observation, data collection and classification, organizing and recording data, graphing, analyzing information, formulating and justifying conclusions. Below are some activities to get you started. I have used these activities with both primary and junior aged students with great success. I hope you and your students enjoy them, too.

PRIZE PROBLEM

Materials:

10 each of 6 colours of cubes or tiles, a paper bag, paper for recording for each small group.

The Problem:

The Crispy-O's Cereal Company has decided to include stickers of the Flintstones characters in every box of cereal: Fred, Barney, Wilma, Betty, Pebbles and Bam-Bam. The cereal company was careful when shipping cereal to stores to send the same number of boxes with each of the Flintstone character stickers. When you buy a box of cereal, you have an equal chance of getting any one of the six different stickers?

How many boxes of Crispy-O's would you have to buy in order to get a complete set of six Flintstone stickers?

Have students predict how many boxes of cereal they would have to buy before doing this experiment (simulation).

Put six different coloured cubes in a bag, each colour to represent one of the six Flintstone character stickers. Explain to the students that without peeking, they will be noting and recording its colour and then replacing it in the bag. They are to continue this procedure until one cube of each colour has been drawn. (ie., How many boxes of cereal they will have to buy before they have one of each sticker?)

A frequency chart for the class to post their results could be made with a follow up discussion. (How many times was the experiment done in total? What was the fewest/most number of draws it took to get one of each of the six different colours? What is the "range of distribution"/"mean"/"median"/"mode"? If each box of Crispy-O's cost \$4.39, about how much would it cost to collect all six stickers? etc.)

BEANS IN A BAG (a good activity to do after reading *Jack and the Beanstalk*)

Materials:

Red and white beans, bag, tally chart, chart paper and markers.

Show students a sample bean and tell them there are 10 in the bag; some are red and some are white. Their job is to determine, through sampling, how many of each colour there are in the bag. Ask them, "What information do we know for sure?" (that there are 10 beans, some are red and some are white). "What could be the possible combinations?" (9+1, 8+2, 7+3...1+9). Begin sampling: Have one student pull out a bean, have another student record its colour on the class tally chart, return the bean to the bag. Repeat this sequence until 30 samples have been taken. (Allow students to change their predictions at any time; they are learning that the larger the sample the more accurate their

prediction will be.)

Have students make a final judgment (hypothesis) about how many of each colour are in the bag based upon the data collected. Have them share their ideas with a partner and together write this up on chart paper with their reasons/ideas, ready to share with the group. After everyone has had a chance to share, show them what was in the bag!

THE GAME OF PIG (a probability game for two or more players)

Material:

Two dice

The object of this game is to score 100 points or more using mental addition, strategic thinking and probability.

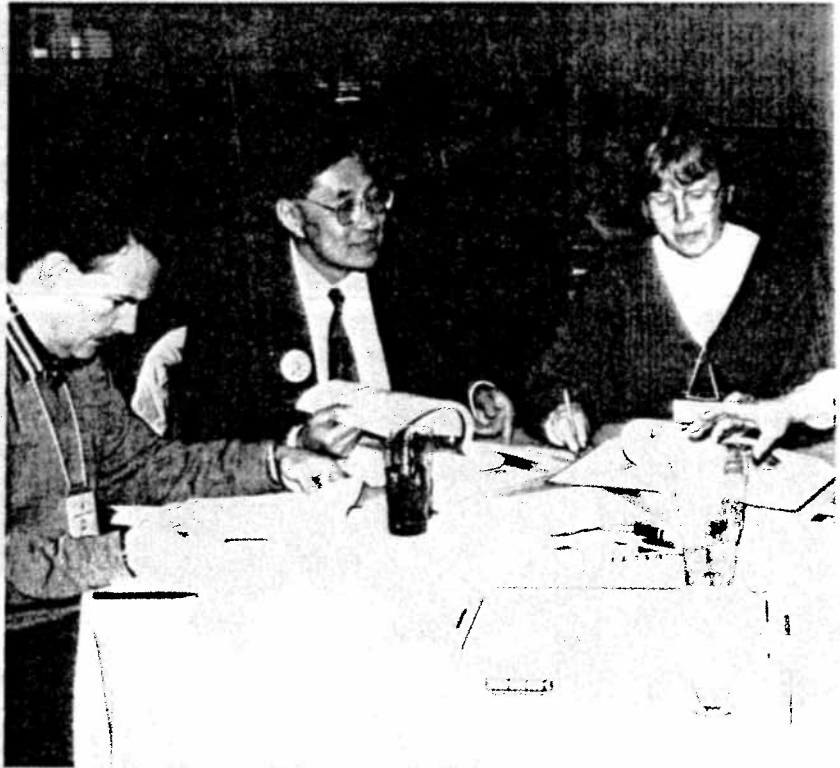
Players take turns rolling two dice. On a turn a player may roll the dice as many times as s/he wants, keeping a mental total of the sum.

When s/he decides to stop rolling, record the total and add it to the total from the previous round(s).

BUT if a one comes up on one of the dice at any time, a player scores a zero for the round and it becomes the next player's turn.

EVEN WORSE if a one comes up on both dice the turn ends AND the player's entire total returns to zero.

A class discussion on the strategies they used could be a follow-up to this game. List the strategies and have partners test them out.



CHAMP members at work at OAME



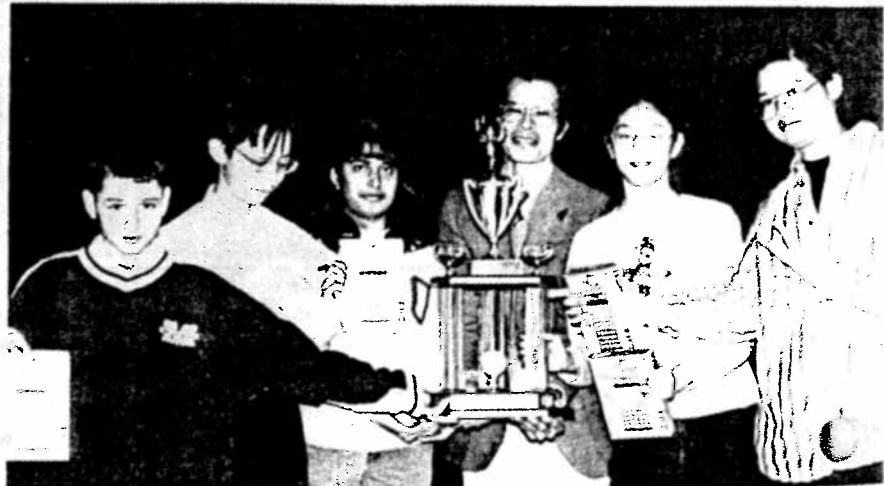
**Martin Grove
Grade 10 Winners (right)**

**Hillside Sr. P.S.,
Grade 7 Winners (Tied) (below)**



**Glenforest, Grade 11
Winners (Tied with Woodlands)
(right)**

**Evan Stratford, Richard Dewey
(below)**





Edenwood Senior P.S.,
Grade 7 Pairs (left)

John G. Althouse P.S.,
Grade 7 (Tied) (below)

est Winners



Erindale Grade 9
Winners (left)

Woodlands Grade 11 Winners.
(Tied with Glenforest) (right)

Hillside Sr. P.S., Bill Seto. (left)
Grade 8 Winners.



FAMILY MATH

'WHAT DID YOU LEARN AT SCHOOL TODAY?'

Grade Nine is a difficult year for students. It may even be more difficult for their parents. This article introduces a simple activity for a Grade Nine Math class that offers students the opportunity to communicate their new knowledge about algebra to their parents. This appears to bolster the students' self confidence, increase their mathematical understanding and helps to keep the connection between home and school alive.

The activity is called "Family Math" and is presented to the students when they are in the middle of their basic algebra unit. They are given a hand-out (page 13) which begins with a short note to parents explaining the purpose of the activity and a request that the parent should pretend that he or she forgot all the algebra they were once taught. The note is followed by simple algebraic expressions to simplify. The student's task is to teach their parents how to simplify the expressions. The reverse side of the page then asks the parents to rate their child on completion of task, quality of explanations and the students confidence with the work. There is also room for the parent to comment and sign. When the students return to class the following day with the completed sheets they are asked to take a few moments to comment on their experience. After writing their comments, most students also want to take a few minutes to share their stories about their parents' reactions, students' frustrations or just a funny story of how it worked out. The activity proves to be worthwhile for a multitude of reasons.

This activity allows students to increase their understanding of their new algebraic skills. Students develop and demonstrate their understanding of Math by communicating what they have learned. One student wrote, "I was able to explain all of them to my dad. It helped me understand algebra better and I learned more about it when my father asked

questions."

In reviewing the returned "Family Math" sheets, I often find that my students have circled "like terms" or drawn arrows to demonstrate the distributive property in ways that are similar to mine. One student wrote in his comment, "I have found it easy to teach my dad algebra. I explained to him exactly what you explained to me." Other students have developed their own style of explanation or had to think of other ways to explain concepts. Martin wrote, "It was harder to teach than I thought. I went too quick. It was weird teaching him something he already knows."

Students' comments often display pride and increased confidence. "My dad thought I didn't have problems with algebra and was proud. I didn't have trouble teaching it to someone else." Another student wrote, "I thought that it was really fun trying to teach my parent how to do algebra when they already know how to." Whereas another wrote, "It was kind of hard. My mom was really frustrating and she actually didn't know what she was doing sometimes."

The activity establishes communication between home and school which is necessary as students make the transition from Grade Eight to Nine. Parents of Grade Nine students are also in their "transition years," for their role is changing. The parents of elementary students are greeted with smiles and hugs when parents arrive to pick up their children. But once the student is in Grade Nine those hugs and smiles often turn to grunts and shrugs, or perhaps the parent is relegated to remain in the car and park by the back door. On Open House Nights and Parents' Nights, elementary school students can't wait to show their parents which desk they sit at and proudly point out their work hanging on the bulletin board. Parents are encouraged to leaf through journals and notebooks, and to

read their child's stories. But when a student hits the front door of high school that often changes. Notices about Parents Night are left in the Grade Nine home forms recycling bin or the bottom of the backpack. And of course, what goes on at school is not discussed. "What did you learn at school today?" receives a response of "Nothing." or perhaps more encouragingly, "Nothing much." Parents' fears escalate. They know that high school is a critical time and "nothing much" is simply not enough.

This activity creates a situation where students are excited to share their new algebraic skills and parents are excited to be a part of that sharing. One parent wrote, "Lisa explained the problems in simple terms. I wish she taught me when I was in school!!" Another parent offered: "I feel this exercise is a very good one. It demonstrates the student's skill at both Mathematics and communication." One parent expressed their appreciation with the comment: "We enjoyed doing this work together. Thank you! She did a great job!"

In summary, I have found that this activity has been highly successful and appears to have more benefits than I first expected. I was surprised and pleased to see this activity appearing in many of my students' portfolios, chosen by them as one of their most valuable experiences in Math. "Family Math" allows students to explain Math, to increase their understanding and to build their self esteem by having their accomplishments valued. Positive communication between parent and student is increased and parents' fears and anxiety about what students are doing in school is reduced. Parents and students appreciate one another's knowledge. As one parent told me "Please, do more of this!"

by: Chris Suurtamm

Family Math
Algebra
Sharing What We Know

Dear Parent/Guardian,

During Grade Nine a student gains their first experience with a comprehensive algebra unit. Understanding the material in this unit is critical to success in many other areas of Mathematics. We have been working on this unit for several weeks and many students are becoming experts at simplifying algebraic expressions.

One focus of our program is that students can communicate Mathematically. This means that they use proper Mathematical form in setting up their work but it also means that they can visualize what they are doing. I am asking for your help in listening to your son or daughter's explanation of how to do these questions. Pretend that you have forgotten the algebra that you have learned in school and allow the student to teach you how to do these questions. Then please complete the back of this sheet so that it can be returned to class. By the student demonstrating to you what he or she is learning in class, the student practices talking about Math and you are able to see their expertise.

Thank-you for your help.

C. Suurtamm

Simplify:

1. $2x-3+4x-8+6x$

2. $3(x-4)+2(x+5)$

3. $(2x+1)(x-5)$

4. $5x^2+2x-3+8x^2-4+3x$

Back of Assignment

Student's Name _____

Homeform _____

This section to be completed by parent or guardian:

	Not At All	Completely
The Student could complete each question		
The explanations were easy to understand		
The Student displayed confidence		

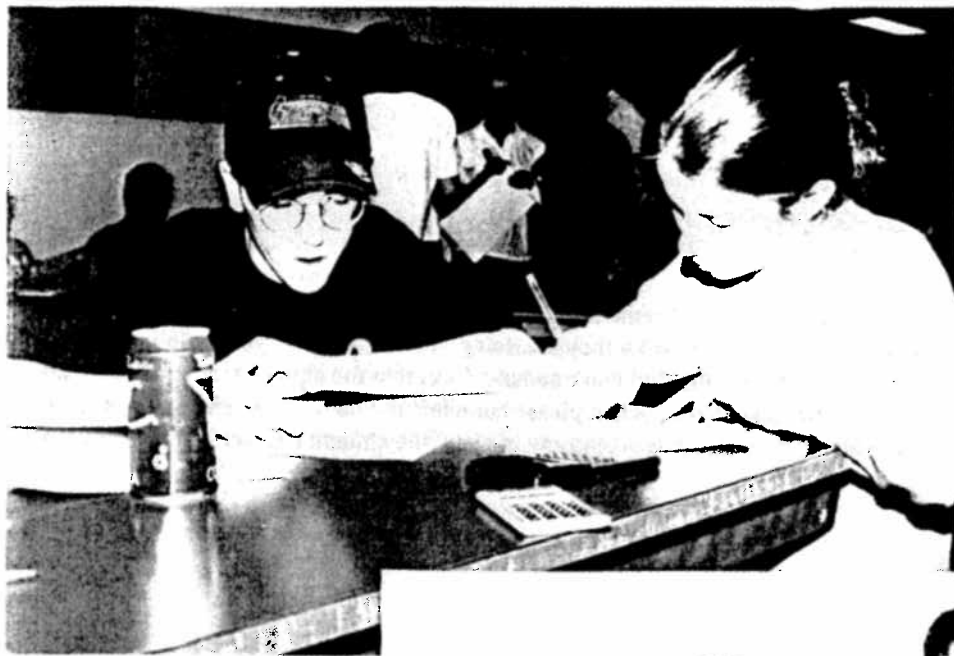
Comments:

Parent/Guardian Signature: _____

Go Bananas

courtesy of Derek Baker (off of the Internet)

A banana plantation is located on the edge of a vast desert. The market for bananas is located directly across the desert, 1,000 km away. To get her bananas to market, the plantation owner has only one camel. The camel can carry up to 1,000 bananas in a single load, but eats one banana for each kilometer it travels. The total production of the banana plantation is 3,000 bananas. Determine the maximum number of bananas which the plantation owner can get to market.



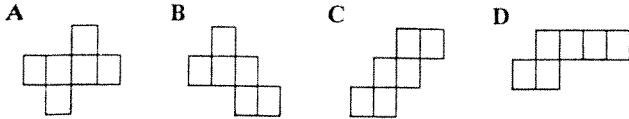
Math Olympics Time Trials



Over 300 Grade 7 & 8 students participated in "Time Trials" to qualify 3 teams for the Provincial Math Olympics in Barrie, June 6-7.

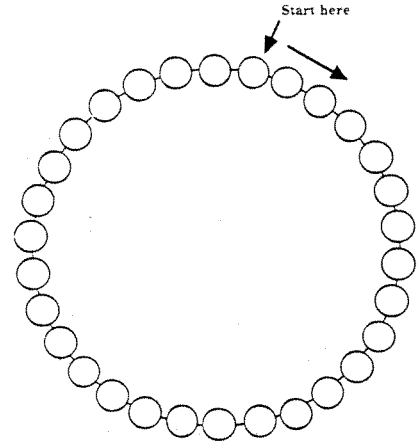
SAMPLE QUESTIONS

Which of the following hexominoes below cannot be folded along the lines to form a cube?



With the start of baseball season, Mike was given thirty baseball stickers. He has 15 Blue Jay and 15 Expo stickers. Mike's father told him that he had set the stickers around a large circle, count them, and give his sister every thirteenth piece until she has fifteen stickers. Mike loves the Blue Jays. How can Mike arrange the stickers so that he gets all the Blue Jay stickers and his sister gets all the Expo stickers.

Try to work out the solution below by placing a "B" for Blue Jay or an "E" for Expo in the circles, moving clockwise from the starting point. Record your final answer on the answer page.



If you could have as many quarters, dimes, nickels and pennies as you want, what is the maximum value you can have and still not be able to make change for a dollar?

Last month Jim bowled 10 games with an average of 190. So far this month he has bowled 4 games with an average of 162. What is his average over that last 14 games?

Cover the grid with only 6 pentominoes so that the sum of the numbers under each pentomino is 20. You will record your answer on the white sheet.

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

It takes a backhoe one hour to dig a 3m by 3m by 3m hole. How long would it take two backhoes, each working at the same rate, to dig a hole 9m by 9m by 9m?

If you wrote the whole numbers from 1 to 100, how many times would you write the digit 5?

- A) 10 B) 11 C) 19 D) 20 E) 30

By only using six 5's and any number of operations (+, -, ×, ÷) along with proper order of operations (BEDMAS), create an expression that equals each of the numbers 1 to 20. The first one has been done for you.

$$\frac{5}{5} + \frac{5}{5} - \frac{5}{5} = 1$$

HOW TO GET LOOPED...

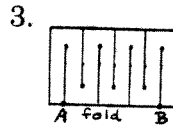
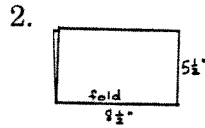
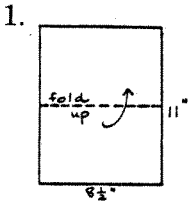
Stepping Out in Style

More Paper-Folding by Marlene Dewey, Clarkson Secondary School

You Need:

- one 8.5" x 11" paper, unpunched
- scissors

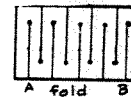
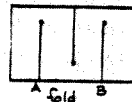
Here we go!



Make cuts on each line shown. Do NOT cut all the way across!

Then cut along fold line from A to B

- Open it up. You should get a big loop, large enough that you could step through it! Amazing isn't it !!
- For younger students a pre-printed template of the cutting lines will make this activity simpler.
- Experiment with fewer or greater numbers of cuts as shown below, discussing the effect on the size of the loop.

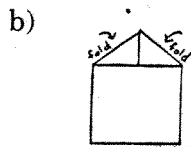
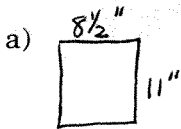


A SELF-MAILING ENVELOPE...

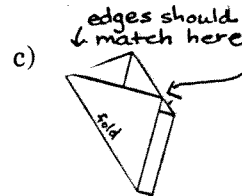
Environmentally and Geometrically Friendly

More Paper-Folding by Marlene Dewey, Clarkson Secondary School

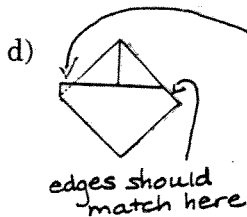
1. Fold as illustrated:



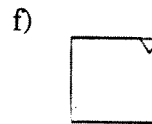
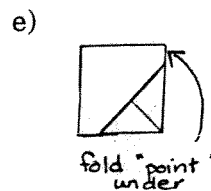
Fold top left and right corners until they meet exactly.



Fold bottom left corner to just touch right-hand edge as shown.



Fold right lower corner to upper left edge to match here as shown.



Turn over...it should be a square with a small triangular flap.

- If a stamp were glued on at the corner where the flap is, it should hold your "letter" together for mailing.

Spring Mathfest '97

By Sue Trew, a consultant with the Dufferin-Peel RCSS Board

This CHAMP Spring event continues to grow in stature and popularity. And why wouldn't it? After all where else could you be wined, dined (well snacked anyway!) and professionally developed for FREE! Spring Mathfest serves a dual purpose: presentation of CHAMP student awards and member appreciation/P.D. The hospitality is extended to non-members for just \$10.

This year the event was centrally located at St. Francis Xavier Secondary School on April 10th. Over two hundred students, parents, grandparents and other relatives were served punch,

coffee, pastries and cookies as they assembled in the cafetorium to watch and take part in the CHAMP Math Contest awards ceremony. Meanwhile, eighty member and non-member teachers gathered in the second floor resource centre, with it's panoramic views North to Brampton and beyond, for wine and "cheese". In fact, the St. Francis Xavier Food Services department head served us mini souvlaki's, Quiche Lorraine, fresh fruit, Swedish-style open face sandwiches, cheese, and orange & mango punch, and wine, with very elegant style. Both company and conversation were friendly and animated. It was a chance to catch

up with former colleagues and to exchange views and ideas as well as gossip, of course!

To round off the event, seven workshops on a wide variety of math-related topics were held in rooms adjacent to the resource centre. Our apologies are extended to the teachers who waited patiently but in vain for one presenter. The CHAMP Executive must assume responsibility for a communication error which led to this. We shall try to book that workshop again for the Fall Mathfest, which is already in the planning stages. Watch for the flyers in September. It will be another CHAMP production not to be missed.



MATH OLYMPIANS AT WORK

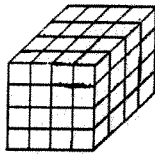


Puzzles to Ponder



by Richard Dewey

- Find the last digit (units digit) in the sum:
 $1! + 2! + 3! + 4! + \dots + 1997!$
- Find the last two digits in the above sum.
- How many squares are there on all the faces of the cube to the right?
 Hint: The answer does not equal 96.
- Electrical tape comes in 19mm width. A long strip of this electrical tape is to be wrapped around a pipe with a diameter of 38mm. At what angle to the edge of the pipe must the strip be placed so that there is no overlap and no spaces between the edges of the tape?
- Here's one your TI-92 graphic calculators probably can't solve.
 Factor: $6x^2 - xy - x - 12y^2 + 10y - 2$

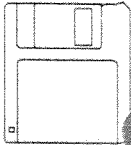


Answers on back page



Book And Software Reviews

by Peter Cox



The last article mentioned the great deal to be had with Borland's Turbo Pascal for Windows. A comment was made then that there existed a great deal of resource material available to help teachers to use Pascal as the vehicle to deliver secondary school Computer Science courses. This column intends to expand a little on that observation.

The process of changing a language used to deliver a programming course such as DST3AO can be a daunting one. Not only must the material be selected, exercises and tests and assignments be created, but all this must be done in the context that the teacher must deal with the mechanics of the new system. Little wonder that few of us change. Here are some short notes on three books that go a long way to make the adoption of Turbo Pascal easy: (There are many more available)

PROBLEM SOLVING AND PROGRAMMING IN TURBO PASCAL
 J.N.P. Hume-Holt Software Associates
 (416-978-6476)
 ISBN 0-921598-19-X

This book is simple, clear and well written. The author is an old hand at producing books on programming, knows the level of his audience and the needs of an introductory text. It is specific to Turbo Pascal and so deals with the nitty gritty of the Integrated Development Environment. No need to cut and paste little introduction packages and exercises. It is already done. Furthermore the author has made

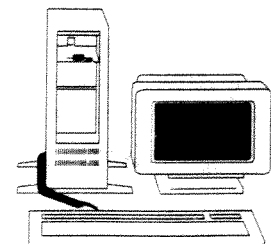
a strong effort to focus on the problem solving aspect of course material rather than only on the teaching of language syntax. A possible textbook that only needs some supplemental materials.

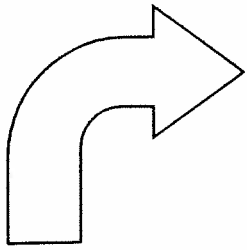
PROBLEM SOLVING IN PASCAL
 John Cater - Addison - Wesley
 ISBN 0-201-11215-9

This is another Canadian book suitable for use in Ontario schools. It is older than the previous book and addresses Standard Pascal rather than Turbo Pascal specifically. An appendix attempts to deal with some of the issues but there are a few small variations to watch for. This is the text that North Park uses. We needed to create our own introduction to the programming environment and treat the graphics separately. The exercises and assignments are very useful. The material is developed in considerable detail. The book can be stretched to serve as a grade 12 text as well.

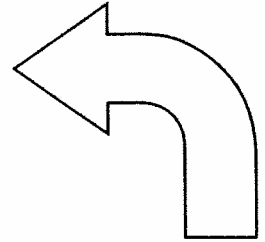
OH PASCAL
 D. Cooper and M. Clancy (1982)
 ISBN 0-393-95205-3

This book is primarily a resource book for us now. It is a programming language text for Standard Pascal. The writing style is very entertaining, very detailed and extends the topics very well. It is an excellent source of exercises, tests, and assignments. It is not specifically directed at Ontario's Secondary School programming courses but would make an excellent resource.





Overhead Tips for Math



by Suzanne Jackson-Lloyd

I recently went to a conference given by Kim Sutton and was happy to get more ideas and tips on using the overhead for Math. I especially liked the concept of "Drill for Thrill and not to Kill." Here are some ideas:

Idea One

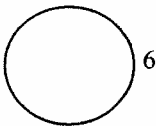
A specific 'Math Fact' such as $+5$ or $\times 3$ is chosen for the week. These facts are practiced all week.

My students like Kim's drill called 'Race to the Booty' which is a series of 20 circles set up as a "race course", with a start and a finish. This can be a handout, or students make a course in their math journals. The current Math Facts (i.e. $+5$) is written on the sheet or top of page in journal.

An envelope or plastic bag with two sets of numbers from 0-9 is needed.

On the overhead show a 'Race to Booty' type sheet. Write numbers that are drawn from the envelope beside the circles for all 20 circles.

eg.



The students write these same numbers on their sheets/journal pages.

An 'Overhead Timer' is then set up. This is like a transparent stop watch. I bought one for \$48 at the

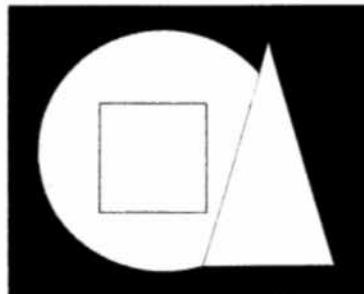
conference. It's called Teach Timer by Stokes Publishing Co.

1292 Reamwood Ave.
Sunnyvale California 94089
Telephone (408) 541 - 9145

When I push "start" the students race through the questions, adding or multiplying the fact number to the circle number and putting their answers in the center of each circle. When they are finished they check their time on the overhead and write the time on their sheets. When everyone is finished (or a specified time limit is reached), students correct their work by having volunteers put answers on the overhead sheet.

I like this drill for several reasons.

- ◇ It is similar to golf (they say), where you're competing against yourself in order to better your score in accuracy and time.
- ◇ It helps those speedy students who finish first yet have a lower accuracy rate to realize that both are important.
- ◇ The key is that the students enjoy it and feel successful!



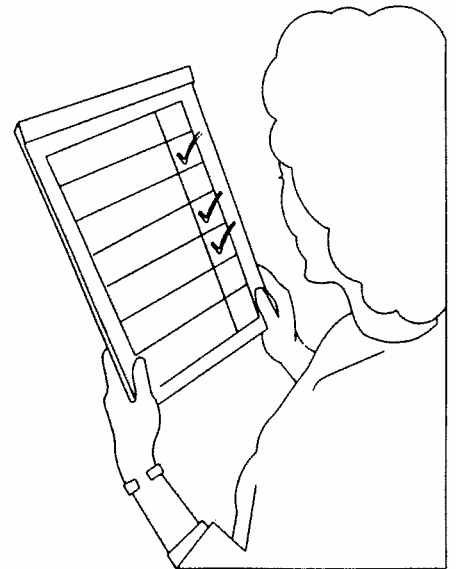
Idea Two

Another trick for the overhead is the use of plastic squares. (The kind the crafters use to create bookmarks, animals and boxes). You can buy them at White Rose or Micheals. When you cut them up to make place value 100's, 10's and 1's they show up really well on the overhead.

Idea Three

Last trick for now is the fly swatter! Cut a rectangle out of the center. Use it on top of your overheads to draw attention to specific information. It's a fun way to highlight answers too!

Kim's conference session gave me lots of neat ideas. With a little creativity you can come up with many more activities to use the overhead as an interest-grabbing teaching tool.



Answers to 3rd set of problems:

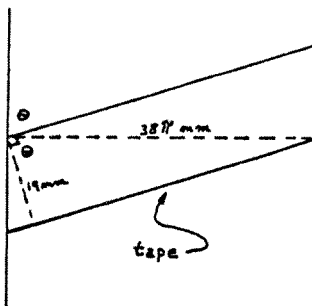
1. Since $5! = 120$ and every factorial after that contains 5! we only have to consider $1!+2!+3!+4! = 33$, therefore the last digit is a 3.
2. Same as above except the sum becomes $1!+2!+3!+4!+5!+6!+7!+8!+9! = 409113$, so the answer is 13.
3. Each face contains $1 + 4 + 9 + 16$ squares of sizes 4×4 , 3×3 , 2×2 , 1×1 or 30 squares resulting in a total of 180 squares.

4. If you were to cut the pipe and flatten it out it would look like the drawing to the right.

Therefore:

$$\cos \theta = \frac{19}{38\pi} = \frac{1}{2\pi}$$

$$\therefore \theta \approx 80.84125^\circ$$



5. $6x^2 - xy - x - 12y^2 - 10y - 2$

$$= 6x^2 + (-y-1)x + (-12y^2 + 10y - 2)$$

if we let y behave like a constant and consider the solution to the equation:

$$6x^2 + (-y-1)x + (-12y^2 + 10y - 2) = 0$$

using the quadratic formula we would get:

$$x = \frac{y+1 \pm \sqrt{(-y-1)^2 - 4 \times 6(-12y^2 + 10y - 2)}}{12}$$

$$x = \frac{y+1 \pm \sqrt{y^2 + 2y + 1 + 288y^2 - 240y + 48}}{12}$$

$$x = \frac{y+1 \pm \sqrt{(17y-7)^2}}{12}$$

$$x = \frac{y+1 \pm (17y-7)}{12}$$

$$\therefore x = \frac{18y-6}{12} \text{ or } x = \frac{8-16y}{12}$$

reconstructing the equation from the roots gives us

$$(12x - 18y + 6)(12x + 16y - 8) = 0$$

which simplifies to:

$$(2x - 3y + 1)(3x + 4y - 2) = 0$$

$$\therefore 6x^2 - xy - x - 12y^2 - 10y - 2 = (2x - 3y + 1)(3x + 4y - 2)$$

CHAMP Executive 1997-98

Here are the results of the recent election

President

Jeff Irvine (mentor)

Secretary

Gill Dunn (mentee)

Treasurer

Irene McEvoy

OAME Representative

Anne Muller

Executive Members at Large

John Rodger

Marlene Dewey

Lloyd Gough

Sue Trew

Jim Vincent

Mike Simpson

Fran McLaren

Rocco DiMatteo