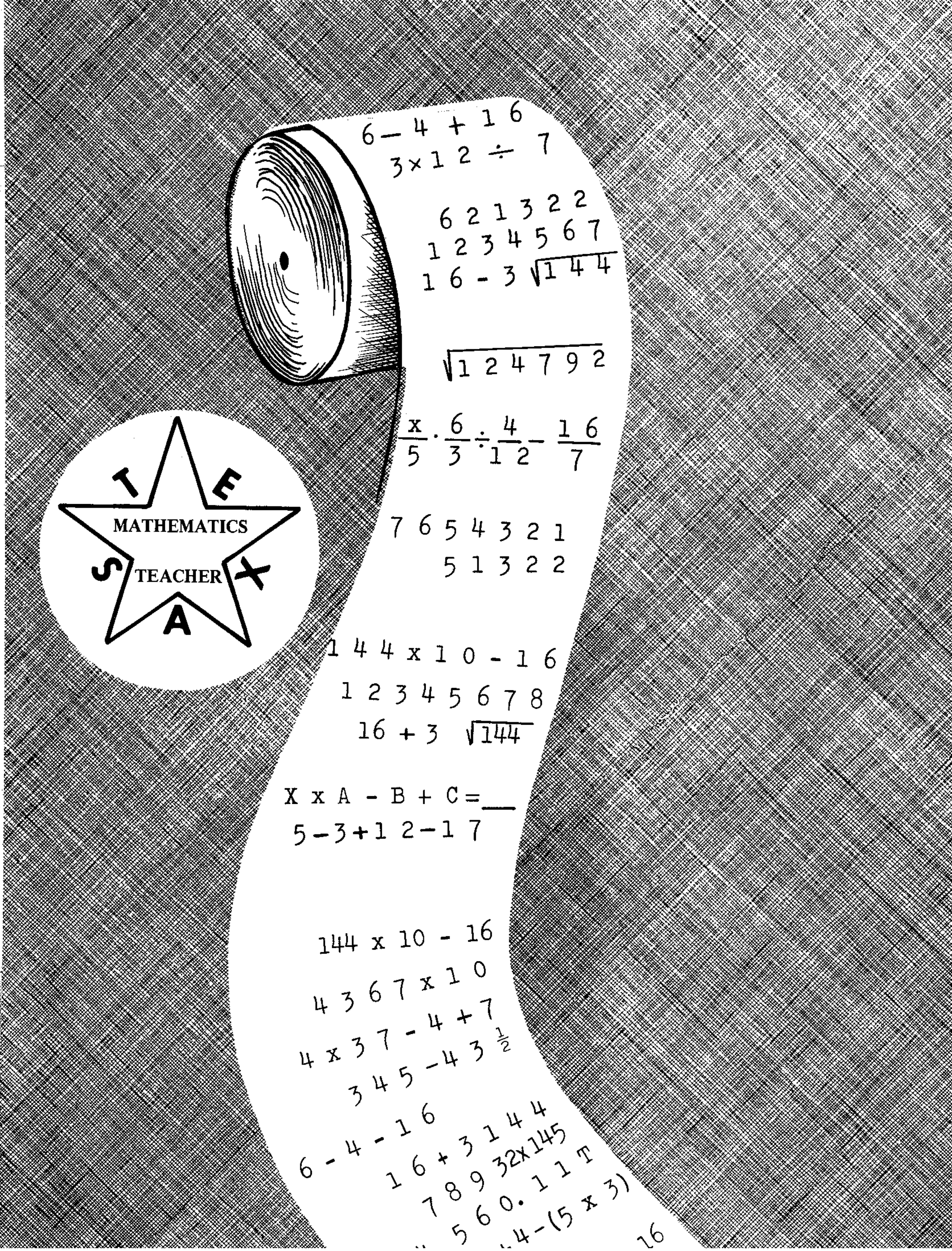

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1 6 - 3 √1 4 4
√1 2 4 7 9 2
x/5 · 6/3 ÷ 4/12 – 16/7
T E X A S
MATHEMATICS
TEACHER
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TEXAS MATHEMATICS TEACHER is the official journal of the Texas Council of Teachers of Mathematics. The views expressed are the contributor's own and are not necessarily those of the publisher or the editor. All manuscripts and correspondence about this publication should be addressed to Mr. J. William Brown, *Texas Mathematics Teacher*, 100 So. Glasgow Drive, Dallas, Texas 75214.

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TEXAS MATHEMATICS TEACHER

Texas Council of Teachers of Mathematics

Volume XXXII MAY, 1985 No. 3

PRESIDENT'S MESSAGE

The 63rd Annual Meeting of the National Council of Teachers of Mathematics has come and gone. It was an honor and a privilege to represent the Texas Council at that meeting. Since we were co-hosts of the meeting, I was asked to be introduced at both the opening session and at the banquet. To be on the stage with Mayor Henry Cisneros of San Antonio, the officers and directors of NCTM, and Superintendent Billy Reagan of Houston ISD was a thrill for me, and it brought recognition to TCTM. From what I saw and have heard the meeting was a success, and we can be proud of our part in it. A hearty round of appreciation for those in TCTM who worked to make the meeting the success it was is in order.

And now for events in the future — as has been true for the past several years, TCTM will be responsible for on-site registration at the 32nd Annual Conference for the Advancement of Mathematics Teaching to be held October 24–26, 1985, at the Hyatt–regency Hotel and the Palmer Municipal Auditorium in Austin. I encourage each of you to attend the conference (CAMT, as it has become to be known), to attend our annual meeting held in conjunction with the conference, and to help with the on-site registration, if possible. If you, individually or as a group, would care to volunteer to assist in the registration, please contact me at the following address:

Ralph W. Cain, Pres. TCTM
Department of Curriculum & Instruction
The University of Texas at Austin
Austin, Texas 78712

Whether you can help us in registration or not, please come to the conference if you can. The theme will be "Mathematics: Teaching the Problem Solvers of Tomorrow." It will be worth your while to come. Spread the word to your colleagues — come to CAMT and join TCTM.

REFEREES WANTED

Manuscripts published in the TEXAS MATHEMATICS TEACHER are reviewed by at least three mathematics educators. Members of TCTM who are regular readers of the journal - classroom teachers, supervisors, and teacher educators - and who would like to review manuscripts should write to the TCTM indicating their willingness to serve and the level of interest (Elementary, Secondary, or both). Send to George H. Willson, Box 13857, North Texas State University, Denton, TX 76203. The Editorial Panel will review the responses and make the final selection.

CAMT

The 32nd Annual Conference for the Advancement of Mathematics Teaching (CAMT) will be held October 24–26, 1985, at the Hyatt-Regency Hotel and the Palmer Municipal Auditorium in Austin, Texas. The theme of this year's conference is "Mathematics: Teaching the Problem Solvers of Tomorrow."

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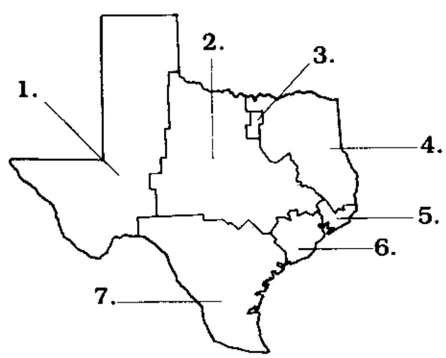

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BASEBALL AND ARITHMETIC: MAGIC NUMBER FORMULAS

David R. Duncan and Bonnie H. Litwiller
Professors of Mathematics, University of Northern Iowa, Cedar Falls, Iowa

Late in each major league baseball season, sports announcers and writers begin to talk about the "magic number" of each division leader. We have observed that many of these announcers and writers would be hard pressed to explain either the origin or the computation of a magic number.

What is a magic number? We will discuss its origin and use, using as a specific example the National League West standings as reported in the September 11, 1984 newspaper. The first place Chicago Cubs' magic number with respect to the second place New York Mets was 12 on that date. This meant that any combination of Cubs' wins or Mets' losses totalling 12 would "clinch" the division championship for the Cubs.

If the Cubs were to win 12 more games, they would win the division championship regardless of what the Mets did. Similarly, if the Mets were to lose 12 more games, they would lose the championship regardless of what the Cubs did. Any other combination would also work, that is, 7 Cubs wins and 5 Mets losses.

How is the magic number computed? We shall show two ways. We shall use the standings as they were reported in the September 11, 1984 newspaper:

	W	L
Chicago	87	57
New York	80	64

Method 1: Suppose that the Mets win every one of their remaining 18 games. Recall that a season consists of 162 games. This would give the Mets 98 wins at the end of the season. To retain first place, the Cubs would have to win at least 12 games. Their magic number is thus 12. In general, suppose that the standings are:

Chicago	W_1	L_1
New York	W_2	L_2

New York would have $162 - W_2 - L_2$ games remaining on its schedule. If they were to win all of these remaining games, they would have $W_2 + (162 - W_2 - L_2)$ or $(162 - L_2)$ wins.

Since the Cubs have already won W_1 games, they would have to win $(162 - L_2) - W_1$ additional games to tie the Mets and $(162 - L_2) - W_1 + 1$ games to win the championship outright. Their magic number is thus $163 - L_2 - W_1 = 163 - (L_2 + W_1)$.

Using the preceding numerical example, their magic numbe would be $163 - (64 + 87) = 163 - 151 = 12$, as was previously noted.

Method 2: Using the same standings as in Method 1, suppose that the Cubs were to lose every one of their remaining 18 games. This would give them 75 losses. The Mets would have to lose at least 12 games to have a worse record and thus give the Cubs a championship. The Cub's magic number is thus 12.

Using the general standings of Method 1, the Cubs would have $162 - W_1 - L_1$ games remaining on their schedule. If they were to lose all of these remaining games, they would have $L_1 + (162 - W_1 - L_1)$ or $(162 - W_1)$ losses.

Since the Mets have already lost L_2 games, they would have to lose $162 - W_1 - L_2$ additional games to cause a final tie, and $(162 - W_1 - L_1) + 1$ to lose the championship. The Cub's magic number is therefore $163 - W_1 - L_1 = 163 - (W_1 + L_2)$. Note that this is the same formula as obtained in Method 1.

Method 3: Suppose that the season were to end with the Cub's wins and the Mets' losses totalling 162; that is, $W_1 + L_2 = 162$ at the end of the season. Since $W_1 + L_1 = W_2 + L_2 = 162$ at season's end, we would know algebraically that $W_1 = W_2$ -- meaning that the Cubs and Mets would end the season tied. For the Cubs to <u>win</u> the championship, either they would have to win one more game or the Mets would have to lose one more game; that is, $W_1 + L_2 = 163$ at season's end.

Consequently at any point in the season $163 - (W_1 + L_2)$ represents the number of additional Cubs wins or Mets losses needed to give the Cubs the championship.

Questions for the reader:

1. Compute magic numbers late in the season for division leaders. In a close race involving a number of teams, several different magic numbers could be computed for the leader and each of the following teams. How should the magic number for the leader and the second place team compare to that for the leader and the third place team?
2. Suppose that $163 - (W_1 + L_2)$ yields a negative number. How could that be interpreted?

Math Jokes

MATH LETTER - Prince George's County

1. What does a math teacher use when he can't pay cash?
   MATHERCARD.
2. Why did the geometry teacher leave school early?
   To catch a plane.
3. What's the difference between an aardvark and an evenvark
   One vark.
4. How did the math teacher get tied up?
   Lower bound & upper bound.
5. Why did the right angle smile?
   He was beside two (a)cute angles.
6. What's the math teacher's favorite part of the newspaper?
   The conic section.
7. What's the math teacher's favorite zoo animal?
   The graph.

BORROWED: THE BANNEKER BANNER, SPRING, 1985

TCTM Journal needs articles for all levels of Mathematics.

PROBLEMS AND CONTESTS

Diane McGowan

Relays can add excitement and variety to a mathematics club meeting or to a mathematics classroom. Relays are useful as topic review. The players are grouped and numbered within the group. Five persons per group works well. Each group receives the same question sheet with one question per player. The first person in the group answers question one and passes the paper to the next player. The second player uses the first player's answer in his question. NYR means "the number you receive."

First Year Algebra Relay

1. When twice a number is decreased by six the result is 12. Find the number.

2. NYR is a in the equation $x^2 - ax = 36$. Find the positive solution to the equation.

3. NYR is n in the expression $(n-9)^3$ Determine the value of the expression.

4. The length of a rectangle is k cm. longer than the width. NYR is k. The perimeter of the rectangle is 82 cm. Find the width of the rectangle in cm.

5. NYR is the x. The point (x,2) lies on a line with slope 2. Write the equation of the line in slope-intercept form.

Advanced Relay

1. For $0 < x < 360$ what is the number of values of x for which $\sin 3x = 1/2$?

2. NYR is n $\genfrac{}{}{0pt}{}{n+1}{3} + \genfrac{}{}{0pt}{}{n+1}{4} =$

3. NYR is a. Find the largest solution of this equation

$$(x^2 - x - a)^2_{10} - 4(x^2 - x - a)_{10} = 5$$

4. NYR is c in the expression.

$$\log_{10}((c+1)\log_{10} 100) =$$

5. NYR is n.

$$\tan\left(\text{Arcsec}\ \frac{n+12}{12} - \text{Arccot}\ \frac{4}{3}\right)$$

Relays are a part of the competition in the New york State Mathematics League and the Atlantic Regional Mathematics League annual competition. A book of relay, short answer and team questions. NYSML-ARML Contests 1973-1982, edited by Harry Ruderman is available from Mu Alpha Theta, 601 Elm Avenue Room 423, Norman OK, 73019.

Suggestions for mathematical competitions and problems should be sent to Diane McGowan, Route 1 Box 259, Cedar Creek, TX, 78612. Your help and encouragement is necessary for this column to continue.

Relay answers: Algebra 1.)9 2.) 12 3.)27 4.) 7 5.) y=2x-12
Advanced 1.) 6 2.) 70 3.) 4 4.) 1 5.) -16/65

Solution to March Problem

A man dropped a bottle over the side of a boat while rowing upstream. He continued to row upstream with the same steady expenditure of effort for three minutes after dropping the bottle. He then turned the boat around and rowed downstream for a distance of two miles at which point he recovered the bottle (two miles relative to the bank of the river from the point where he turned the boat around to the point at which he recovered the bottle). How fast was the man traveling (relative to the bank of the river) as he was rowing downstream?

r= rate of boat in still water in miles per minute; c = rate of the current in miles per minute; y = distance traveled upstream from the time the bottle was dropped before he turned around; x = the distance the bottle traveled downstream ; t= time in minutes the boat travels down stream after turning around

$y = 3(r-c)$ $x = (t+3)c$ $2 = t(r[c)$

$x+y = 2$

Therefore, $3(r-c) + (t+3)c = t(r+c)$

Simplifying results in $t = 3$ minutes

Hence, $r+c = 2$ miles/minute or 40 mph

STUFF Strategic Tactics Ultimately For Fun

Dear T.C.T.M. Members,

This is it! The last issue for this year. There is no excuse for you not to send in your ideas this summer. We will be back in the fall and we want lots of "Stuff."! Carry your notebooks to Cancun and write up those activities! Move, Move, Faster, Faster, Be the first on your block with your name in the TCTM journal. Remember, an activity gets you a free membership! But this offer can not last! Send your activities to Judy Tate, Harris County Department of Education, 6208 Irvington Boulevard, Houston, Texas 77022.

Sincerely,
"Stuff" Editorial Staff

PRIMARY

Here are four number finger plays to use with young children to develop beginning number concepts.

ONE-TO-ONE-MATCHING COOKIES

Cookies, cookies.
Cookies I see.
Cookies, cookies
Match them with me.
One is for Tommy
One is for Betty
One is for sister Sue;
One is for Jerry
One is for Alice
And here is one for you!

FOUR LITTLE MONKEYS

Two little monkeys sitting in a tree.
Were joined by another and that made three.
Three little monkeys in the tree did play,
They chattered and chattered in a happy way.
Three little monkeys wishing for some more,
Another came to join them and that made four.
Monkeys, monkeys, how many do I see?
Four little monkeys sitting in a tree.

CARDINAL NUMERALS:
I SEE THREE

I see three--one, two, three,
Three little bunnies
Reading the funnies.
I see three--one, two, three
Three little frogs
Sitting on logs
I see three--one, two three
Three little kittens
All wearing mittens.
I see three--one, two, three
Three little bears
Climbing upstairs.
I see three--one, two , three
Three little ducks
Riding on trucks.

COUNTING KITTENS

One little kitten with a furry tail;
Two little kittens lapping milk from a pail
Three little kittens rolling on the floor;
Four little kittens running out the door;
Five little kittens roll a yellow ball;
Six little kittens and now that's all.

PRIMARY

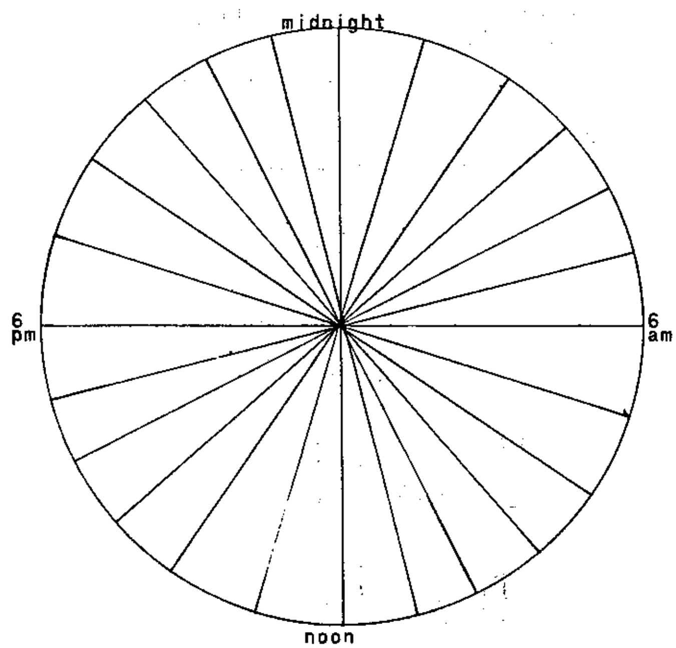
This activity develops time concepts for students who do not understand the passing of time.

DIRECTIONS:

DAY BY DAY

How do you spend your day?
color: Sleeping - blue
In the car - green
Eating - green
School - orange
Watching TV - red
Playing - yellow

What do you do most each day?
How many hours are you in school?

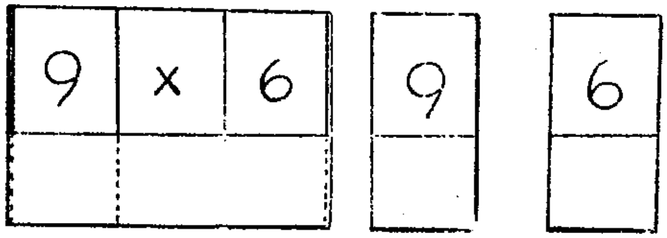


ELEMENTARY

POCKET MULTIPLICATION
(2-5 Players)

PREPARATION:

Make a set of three-by-five-inch cards with the products for the basic multiplication facts you want children to practice. Make a set of twenty factor cards for each child writing a 0 on the upper half of two of them, 1 on two, through 9 on two. Make a pocket card holder for each player from a six-by-nine-inch piece of railroad board. Fold up two inches of one long side (the bottom width) to make a four-by-nine-inch card holder. Staple each end of the folded strip and point one-third of the way in to make a pocket at each end. Mark an "X" at the upper center of the holder. Prepare an answer key so the leader can check answers during the game.



DIRECTIONS:

1. Each player has a pocket card holder and a set of factor cards. He arranges his factor cards face up according to number.
2. The leader - a student not playing the game or an aide - shuffles the product cards and shows one.
3. Each player picks up two factor cards which equal this product and puts one in each end of his card holder.
4. The first player to have his cards correctly placed and facing the leader wins a point for the round.
5. The game continues with the leader showing products and the players showing factors until all the product cards have been shown.
6. The winner is the player who earns the most points.

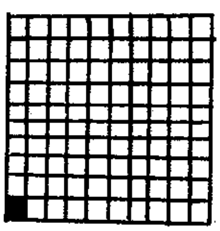
VARIATION:

Use sum and addend cards to make an addition game.

INTERMEDIATE

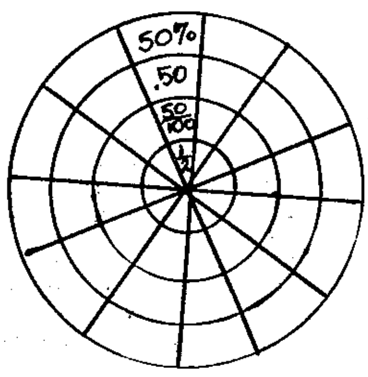
Here are three ideas for extending your percentage lessons. 100 squares can be shaded to show:

1 out of 100 = $\frac{1}{100}$ = .01 = 1%



Two Percentage Wheels can provide a team relay of finding all of the names for a fraction.

$\frac{1}{2}$ ($\frac{50}{100}$, .50, 50%)



Sear's or Ward's catalogs provide a wealth of material involving decimals and percentage. Each student chooses his own article, figures the price including the tax.

Submitted by
Betty Beaumont
San Antonio ISD

INTERMEDIATE

2 CARD POKER
(Mathematical Poker)

Grade Levels: 4-8

Topics: Addition, Subtraction, Multiplication, Division.

Materials: 1 deck of playing cards and 100 poker chips for each set of 6 players. e.g., for a class of 30 students you'll need 5 decks of cards and 500 poker chips. Playing cards can be bought for 39 cents a deck, poker chips for 79 cents per 100 chips.

Directions: Each player is going to be dealt 2 cards, and whoever has the highest total with his two cards will win the chips that are bet. The total of a player's 2 cards is arrived at by adding, subtracting, multiplying, or dividing the value of the 2 cards. (There are 4 basic variations of this game depending upon which of the 4 above operations you choose.) Each card counts its' face value except Jacks are worth 11, Queens 12, Kings 13 and Aces 14. Example: If a player holds a Queen and a 7 his hand would be worth 84 points (12 X 7) in the multiplication variation of this game. In like manner that same hand would be worth 5 points (12-7) in the subtraction variation and 1 5/7 (12-7) in the division variation.

The white chips represent nickels, the red chips represent dimes, and the blue chips represent quarters. In actual play, only one card is dealt face down and each player may "call," "bet," "raise," or "fold" in his turn. After a round of betting is concluded, the last card is dealt to each player face up. This is followed by a round of betting. Then all players expose both their cards and the highest total wins all the chips that were bet for that deal of the game. Deal passes to the left.

Play continues for a given time period (usually about 45 minutes). Whoever has the most chips is the winner of the game.

If a player loses all of his chips he is "broke" and is out of the game. He must just sit and watch the others play.

"Fold" means to quit fot that deal. This happens when a player's card(s) are low and he thinks he has no chance of winning. He give his cards back to the dealer who puts them on the bottom of the deck. When a player "folds" whatever he has bet already stays in the "pot" (a place in the center of the table where bets are placed).

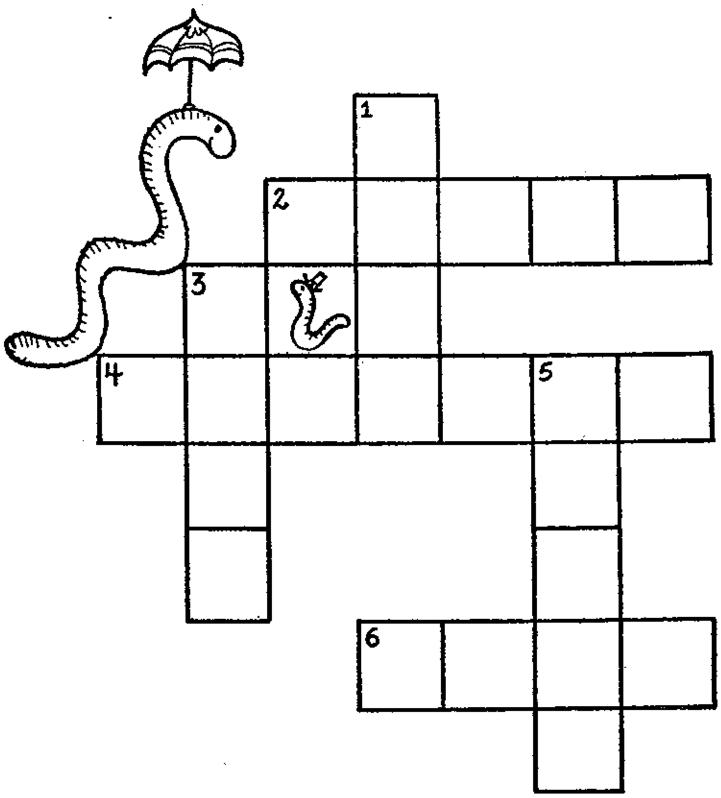
"Call" means a player must match the bet of the player preceding him or else "fold" (quit). There is one other option open to him - he may "raise" the amount of the bet if he wants. The maximum amount of each bet or raise is a quarter.

CRAZY MEASURES

ACROSS:
2. A ship's speed is measured in _______.
4. We measure the sea depth in -----.
6. A yard is three -----.

DOWN:
1. A hairless caterpillar is called an ----- worm.
3. Three feet make one -----.
5. We went fifty ----- per hour.

Answers: ACROSS: 2. knots 4. fathoms 6. feet
DOWN: 1. inch 3. yard 5. miles



MIDDLE SCHOOL

PI BY TOSSING A COIN

Rule off a square card with equally spaced lines parallel to the edges, or since you need only the points of intersection of the lines, you can make small holes of drive brads. Toss a coin at the board for 15 or 20 minutes and observe whether it makes contact with a point. Multiply the number of contacts by the area of the square and divide this product by the number of tosses times the square of the radius of the circle. The result is an approximate value of pi. In order to make certain that the coin does not touch two points at the same time the points should be separated by at least the diameter of the coin. A convenient arrangement is one in which the distances between points equals twice the diameter of the coin; then pi equals times the number of contacts divided by the number of tosses.

Submitted by
Evelyn Robson
Goose Creek ISD

SENIOR HIGH

WHO DID IT?

Donovan Ell was killed on a lonely road two miles from Trenton at 3:30 a.m. on February 14. Five men were arrested a week later and questioned. Each man made four simple statements of which three were absolutely true and only one of them false. One of these five men killed Donovan.

SHORTY

I was in Chicago when Donovan was murdered.
I never killed anyone.
Red is the guilty man.
Joey and I were pals.

HANK

I did not kill Donovan.
I never owned a revolver in my life.
Red knows me.
I was in Philadelphia the night of February 14.

TONY

Hank lied when he said he never owned a revolver.
The murder was committed on Valentines Day.
Shorty was in Chicago at that time when the murder was committed.
One of us five is guilty.

JOE

I did not kill Donovan.
Red has nver been in Trenton.
I never saw Shorty before.
Hank was in Philadelphia with me the night of February 14.

RED

I did not kill Donovan.
I have never been in Trenton.
I never saw Hank before now.
Shorty lied when he said I'm guilty.

WHICH ONE OF THE FIVE WAS THE MURDERER OF DONOVAN??????

MANUSCRIPTS NEEDED!!!! Send them to
100 S. Glasgow, Dallas, Texas, 75214.

"ZERO, NOT O(H) IF YOU PLEASE"

by Mark L. Klespis, The University of Alabama-Birmingham
and Charles E. Lamb, The University of Texas at Austin

(Ideas for this article were formulated in their original form while Charles E. Lamb was presenting to a session of Dr. Steve Larsen's class on learning disabilities at The University of Texas at Austin. Special thanks are extended to Terry Dunning, a graduate student in that class.)

How many times have you heard someone say, "My phone number is four-four-five-oh-two-six-oh (445-0260) as opposed to "four-five-zero-two-six-zero"? Obviously, the second statement is more mathematically correct (assuming the phone identification is not letters and numerals mixed together). Does it matter?

A recent article by Wheeler and Feghali (1983) pointed to the fact that preservice elementary school teachers had a somewhat ambiguous concept about the number zero. Often, zero was seen as being synonymous with "none" or "nothing", and as such was not treated as a number. The authors' experiences with preservice teachers in mathematics and mathematics methods courses support these notions. Wheeler and Feghali suggest that greater attention be given to the concept of zero and call for a concerted effort on the part of mathematics educators to strengthen teachers' understanding of zero. The present article will examine some possible ambiguities inherent in the concept of zero and offer suggestions for improving the situation.

It is almost trivial to say that the concepts taught in elementary school mathematics are basic to further mathematical development. Basic, in this sense, should not be confused with simple or easy. Skemp (1971) has said that the building of conceptual structures should begin early in school. Otherwise, knowledge may only be encoded in symbols, i.e., memorized. Maybe this is part of the problem with zero. There is confusion between the symbol "0" and the concept associated with it. Further, the student who writes "0 is nothing" might, on further questioning state that 0 means a set with no objects. Computational errors of the the type 5/0 = 0 noted in Wheeler and Feghali and observed by the authors' suggest that the problem with zero is probably not a simple error in communication.

In searching for reasons for misunderstandings of zero, it should be noted that two of the functions of symbols are recording knowledge and communication (Skemp, 1971). Too, one of the reasons symbols are attractive is their conciseness. However, while manipulating them in mathematics problems, the concepts they represent can lose their concrete meaning (Howson, p. 568). Consequently, the symbol becomes the concept and is treated as if it had its own meaning. Since there is a connection between the symbol and the concept it represents, a type of "symbolic understanding" is desirable (Skemp, 1982). Here, the connection between the symbol and the underlying conceptual structure is dominated by the conceptual structure. That is, when one sees the symbol for zero ("0") one should associate it with the cardinal number of the empty set, rather than the concept "nothing". With symbolic understanding, it is hypothesized that a person not only uses the symbol correctly, but has a well-developed sense of what the concept represents. This also has the advantage of preventing erroneous responses as in the following: "What is $n(\{0\})$?" Answer, "0"; or "Is $0 = \{0\}$?" Answer: "yes, because the symbol on the right stands for the "empty" empty set and has nothing in it. Therefore, it is equal to 0."

It is also important for the learner to develop an understanding of the use of zero in a relative sense. For example, the use of zero as the freezing point of water on the Celsius scale of temperature is a use of zero in the relative sense. Other examples are the Equator and Prime Meridian when dealing with latitude and longitude.

Thus, if an individual has a well-developed sense of the concept zero and its associated symbol, it may not make much difference whether 0 is read as "Zero" or "Oh" if the context is clear. Unfortunately, the context is not always clear. For example, how should we interpret the following license plate number: ESO 426? (Isn't it interesting that we call ESO 426 a number?).

However, this symbol is not used to name a cardinal number but instead to name an automobile. At other times a symbol may name a letter or a numeral. Thus, it is not surprising that there is confusion among preservice teachers and young children when language and number concepts are being learned.

What should be done? To teach the concept of zero, a teacher should have some well-developed concepts of properties of sets and cardinality. This can be done first at an intuitive level, using physical situations requiring zero. As an example, 5 flat objects (coins, lima beans, etc...) can be colored on one side. The student can toss all the objects in a box, and list the possible outcomes in terms of the colored and non-colored combinations which turn up. Among the six possible outcomes will be 5 colored with 0 non-colored, and 0 colored with 5 non-colored. When describing the combinations the cardinal number obtained, "zero", rather than "o", should be used, the rationale being that "zero", not "oh", names a quantity.

To further test teachers' concept of zero, use questions such as:

Is $0 \in \{\ \}$?

Is $\emptyset = \{\emptyset\}$? Why or Why not?

What is the cardinal number of $\{\ \}$? of $\{\emptyset\}$?

of $\{0\}$ where zero is the only member?

Does the letter o = $\emptyset$? Why or why not?

Can you describe a set with 0 (zero) elements in it.

Whey can't we divide by 0?

Other questions of a similar nature can be easily devised.

It is the authors' belief that too little emphasis is placed on this topic possibly because it may be seen as too trivial. Without a clear understanding of zero, however, teachers transmit their misconceptions to students.

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IN MEMORY OF ANITA PRIEST

Anita Priest, dedicated mathematics teacher and long-time member of GDCTM, passed away on February 23, 1985, after an extended illness. She had taken sick leave from her teaching position at Skyline High School in Dallas ISD last May in hopes of being able to return to teaching in the fall. When her condition failed to improve, she finally retired at the end of January, 1985.

Anita was very involved in the GDCTM; she was willing to do anything that needed to be done, no matter how large or small. She held every office in GDCTM during her many years with Dallas ISD. Anita was also a member of Delta Kappa Gamma, the honorary education fraternity. At the state level, she served the Texas Council of Teachers of Mathematics as President-elect, President, and Past President from 1977 to 1981. At the national level, she served on the Nominating Committee of the National Council of Teachers of Mathematics in 1982 and 1983. Anita was very involved in her profession, both in and out of the classroom. In her quiet way she made many contributions to mathematics education, and we will miss her.

In honor of Anita, GDCTM has established the "Anita Priest Scholarship Fund." The funds will be used to help teachers who are wanting to take more graduate work in the field of mathematics. Beginning this summer, two $200 scholarships will be awarded to selected teachers. Those interested in the scholarships should call Cindy Fore (school--526-4800; home--495-8351) for an application for the scholarships. Application forms may also be picked up at the GDCTM May meeting. Applications must be returned to Cindy by May 15, 1985, for the summer scholarships.

For those interested in contributing to the Fund, donations may be sent to Josephine Langston, 127 W. Harvard Drive, Garland, TX 75041. Checks should be made to the "Anita Priest Scholarship Fund."

PLEASE SOLICIT NEW MEMBERSHIPS!

PROFESSIONAL MEMBERSHIP APPLICATION

Date: __________ School: __________ School Address: __________

Position: ☐ teacher, ☐ department head, ☐ supervisor, ☐ student,* ☐ other (specify) __________

Level: ☐ elementary, ☐ junior high school, ☐ high school, ☐ junior college, ☐ college, ☐ other (specify __________

Other information __________

		Amount Paid
Texas Council of Teachers of Mathematics	☐ New membership ☐ Renewal membership	5.00
Local ORGANIZATION: __________	☐ New membership ☐ Renewal membership	
OTHER: __________	☐ New membership ☐ Renewal membership	

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National Council of Teachers of Mathematics	Check one: ☐ New membership ☐ Renewal membership	
	$35.00 dues and one journal ☐ Arithmetic Teacher or ☐ Mathematics Teacher	
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	12.00 additional for subscription to *Journal for Research in Mathematics Education* (NCTM members only)	
	The membership dues payment includes $13.00 for a subscription to either the *Mathematics Teacher* or the *Arithmetic Teacher* and $2.00 for a subscription to the *Newsletter*. Life membership and institutional subscription information available on request from the Reston office.	

*I certify that I have never taught professionally __________ *(Student Signature)*

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