ABACUS

OAME

A PUBLICATION OF THE
ONTARIO ASSOCIATION for MATHEMATICS EDUCATION

Volume 4 Number 3 January 1977

INTERMEDIATE DIVISION CURRICULUM REVIEW

As your representative on the ministry's committee for establishing a core and new curriculum, I should be most grateful for your views.

You may already know of the "Recommendations for Intermediate Division Mathematics in Ontario", otherwise known as the "Pogue Report" Needless to say, this document is being very carefully considered by the committee. Mr. Pogue is a member of the committee, and he is also a councillor for O.A.M.E.

The recommendations of this report are in brief as follows:-

1/ Statistics and Probability should be implemented as a core topic.

2/ Flow charts should be included as an integral part of the mathematics curriculum.

3/ A study of computers should be integrated into the mathematics curriculum.

4/ Relations and functions should be introduced early in the programme.

5/ Estimating, approximating and reasonableness of answers should become an integral part of the programme.

6/ Transformations should become a topic considered essential for all students.

continued on page 3

YOUR MEMBERSHIP IN OAME INCLUDES THE ABACUS YOU CAN COUNT ON IT!

WRITE TO THE SECRETARY TREASURER

1976-77 EXECUTIVE

Tom Griffiths,
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FINANCIAL STATEMENT OAME YEAR ENDING AUGUST 31/76

RECEIPTS

Bal. on hand	13190.95
London Convention	5023.33
Gazette Subscriptions	2622.54
Membership Fees	8628.51
Interest	946.35
NCTM Sales	502.05
St. Catharines Conference	200.00
NCTM Joint Membership Grant	700.00
	31813.73

Certified Correct

D. MacIntyre

J. McArthur

EXPENDITURES

O.E.A. Registration	200.00
Father Faught Award	72.03
NCTM Affiliation	30.00
NCTM Joint Membership	1874.59
Telephone	104.30
Electric Stapler	96.30
Postage	520.49
Office Expenses	963.85
Gazette Publication	6782.84
Abacus Publication	886.76
Executive Expenses	964.73
Council Expenses	3197.22
Insurance	33.00
Secretary's Expenses	340.12
Sec. Honorarium	1200.00
Chapter refunds	1000.00
Publications Committee	32.75
Projects Committee	15.95
Chapter Committee	16.00
Sr. Cyclic Committee	524.00
Membership Committee	622.93
COMA Grant	400.00
NOMA Grant	150.00
G.V.M.A. Publications	684.78
Ottawa Advance	800.00
Membership refund	152.50
Banking Expenses	137.75
President's Gift	55.85
Auditors	20.00
NCTM Building Fund	1000.00
St. Catharines Conference	200.00
Balance on hand	8734.99
	31813.73

CLARIFICATION - December Gazette
On the Ottawa Conference Registration form under benefits of Membership it states memberships purchased are valid till August 31/77. Since it is now after January 1/77 memberships purchased at the time of registration are valid till August 31/78 unless it is a member renewing his 76-77 membership - see page 71 Volume 15 Issue 2.

MEMBERSHIPS 77-78
OAME now has over 100 Elementary Schools who are members of the Association. Have the principals of these schools allowed in their 78 budgets the $10 membership fee for OAME? The office now has the seals and pocket identification cards for next year and would be only too pleased to process your invoices for membership.
OAME looks forward to your support. Memberships purchased now are valid till August 31/78.

7/ The following topics should be excluded from the core:- division of polynomials, factoring, operational manipulation with rational algebraic expressions, and complicated word problems.

8/ Geometry should be studied from a variety of points of view; transformations, vectors, concrete models, measurement, traditional Euclidean, and when feasible should involve a mix of synthetic and analytic techniques.

9/ Measurement should receive much more attention than it does in the present programme.

10/Trigonometry should be introduced as a core topic at the grade 10 level.

11/The heavy emphasis on structure should be eliminated from the program.

12/Computational skills should be related to and motivated from, problems, applications and games, rather than an end in themselves.

The concept being adopted by the committee is to gradually evolve changes in the curriculum. This will involve constructing courses which will change slightly every year, and of course allow teachers a longer period of time, than was possible in the past.

One proposal to achieve this objective is to circulate the curriculum in a loose leaf form, in order that individual sheets can be modified. It is further hoped that modification will be submitted by teachers, and that those accepted will have the teacher's name mentioned on the sheet. In this way the document should eventually become a "grass roots" curriculum.

Furthermore we are well aware that the present text books must remain in use for the next year or two, and so the new curriculum must be written in such a way that these texts are sufficient for teaching purposes, along with an additional minimal amount of resource material. This will ensure that the writing teams have time to consider any new directions carefully, and do not have to produce new texts in too great haste.

Please send me your comments and opinions to:

Mr. Thomas J. Griffiths,
30 Conifer Close,
London, Ont.
N6K 2X4

Problems submitted by T.G. Griffiths, A.B.Lucas S.S. London

Would your students like to be able to solve problems such as the following?

1) $(x - 5) + (x + 2) - (6 - 2x) = 3$

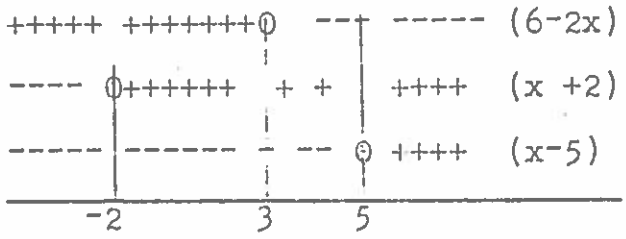
or

2) $x^2 - 3x - 10 > 0$ or $(x - 5)(x + 2) > 0$

or

3) $\dfrac{(x-5)(x+2)}{(6-2x)} < 0$

These questions or any others in which it is necessary to consider in which regions a set of binomial expressions are positive or negative, can be simplified considerably by considering the following method.
Above a number line mark the regions in which each binomial to be considered is positive or negative, either by using +++,--- as below, or more easily by a colour code. Then for each binomial in the problem the parity at any section of the domain can be obtained at a glance



Question 1) If $x \geq 5$ then we can see from the diagram that $(x-5) \geq 0$, $(x+2) >$ and $(6-2x) < 0$ therefore only the sign of $(6-2x)$ need be changed.

$\therefore (x-5) + (x-2) - (2x-6) = 3$

$\therefore 3 = 3$

for $x \geq 5$ This is an identity

If $3 \leq x \leq 5$ both $(x-5)$ and $(6-2x)$ are negative

$\therefore (5-x) + (x+2) - (2x-6) = 3$

$\therefore x = 5$

If $-2 \leq x \leq 3$ only $(x-5)$ is negative

$\therefore (5-x) + (x+2) - (6-2x) = 3$

$\therefore x = 1$

and if $x < -2$ $(x-5)$ and $(x+2)$ are negative

$\therefore (5-x) + (-x-2) - (6-2x) = 3$

$\therefore -3 = 3$ no solution

Question 2)
When $(x-5)$ and $(x+2)$ are both negative or both positive their product is positive as required. From the graphs it can be seen that this occurs for

$x < 5$ or $x < -2$

Question 3) This is solved in exactly the same way as question 2 except that a solution is achieved whenever an odd number of the binomials are negative.

$\therefore -2 < x < 3$ or $x > 5$

I find that students find this tool very simple to use and very effective in simplifying this type of problem. It can also be used effectively in graphing such complicated functions as

$$y = \frac{(x-5)(x+2)}{(6-2x)}$$

ANNOUNCEMENTS

South Western Ontario Association for Mathematics Education will hold a conference at Windsor on March 5, 1977.
The Fourth Leadership Seminar for Elementary Mathematics Teachers will be held at the Ascot Inn, Rexdale Ave., Toronto, Ont. on Oct. 19-22, 1977. Please see the account of 1976 Seminar in the December issue of the Gazette, page 69. We encourage all members to contact their school boards within the next three weeks re attendance at this seminar. A preliminary list of speakers and topics will have been received by board personnel by that time.

All members of OAME whose main interest is in the Intermediate Division are asked to read carefully page 1 & 3 of this issue of the Abacus and send comments to Mr. T. Griffiths.

Nominations for OAME for President-Elect 3 Directors and 10 councillors are no w due. Please send to Mrs. Joan Routledge Box 194, Aurora, Ont. L4G 3H3 -see page 72 December Gazette.

The NCTM members of whom we have several hundreds now are reminded of three important items.

(1) Mail before Feb. 15/77 your election ballot card. This should have been received in mid January from NCTN.
(2) Plan to attend the 55 Annual meeting at Cincinnati, Ohio, April 20-23, 1977.
(3) Plan a summer vaction to Newfoundland and attend an NCTM conference at St. Johns July 20-24/77

THE MOST IMPORTANT ITEM

OAME Annual Conference at Carleton & Ottawa Universities May 13,14, 15, 1977. Please use registration form in the centerfold of the December Gazette.

The office of OAME, along with the Chairman of the Publication's Committee, have put together this Abacus.

There is (1) an urgency to comment on the report of the Intermediate Division Curriculum Pages 1 & 3

(2) an urgency to mail in your nominations for the OAME Annual meeting.

Correction Re the calculator solitaire Game of this Abacus the blank card should be an 8 card and the 8 card should be a 7 card. Sorry for this inconvenience.

A SNAPPY QUIZ

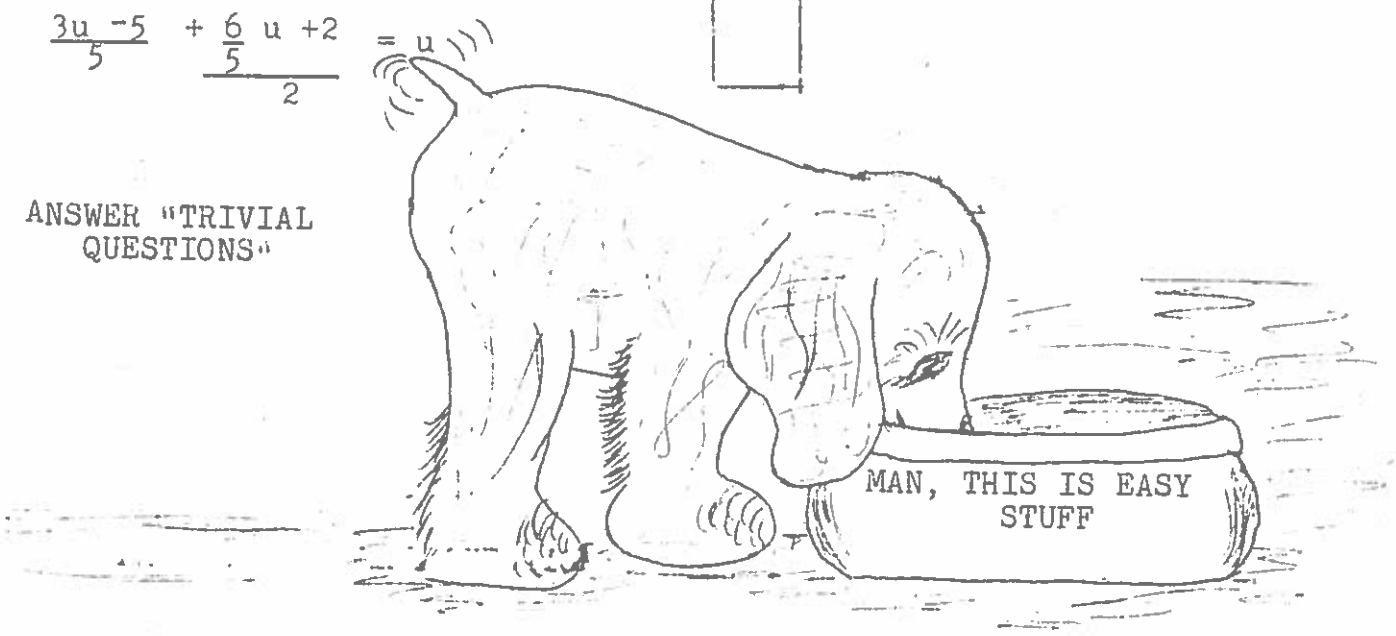
BOB TUCK, West Ferris
Sec. School, North Bay

Find the message by using the code for each answer, locate the letter in the code. Unscramble the letters to make "sensible words.

Solve	Letter from Code
$5X - 3 = 2x + 9$	
$2x - 5 = 5x - 2$	
$1/2C = 1/3C + 1$	
$3(2x-5) = 4(x-7)$	
$\frac{m-3}{2} - \frac{3}{2} = \frac{m}{6} - 1$	
$\frac{5}{3}t - 7 = \frac{1}{2}t + \frac{7}{3}$	
$3a - 2 + a - 4 = 2(a+4)$	
$2(1-2c) = 0 - (c+19)$	
$-2(3x-5) - x = 3(1-2x) + 1$	
$2(y-5) - 5(y-4) = 3(y-5)$	
$4n + 3 + 7(n+4) = 3n - 1$	
$3(2f-4) - (f-7) = -5$	
$3(x-7) + 2(x-2) = 2(x-3) - (2x+4$	
$x + 2(x-3) = x + 18$	
$\frac{1}{5}y - \frac{3}{4} = 2y + \frac{1}{2}$	
$\frac{\frac{3u-5}{5} + \frac{6}{5}u + 2}{2} = u$	

The Code			
A	-1	N	-4
B	-3	O	$\frac{25}{6}$
C	+5	P	-8
D	$-\frac{6}{7}$	Q	3
E	$-\frac{25}{36}$	R	8
F	+1	S	0
G	$+\frac{1}{2}$	T	7
H	$+\frac{42}{13}$	U	12
I	6	V	$-\frac{13}{2}$
J	$-\frac{3}{7}$	W	-2
K	9	X	11
L	4	Y	$\frac{43}{10}$
M	-10	Z	$\frac{13}{2}$

ANSWER "TRIVIAL QUESTIONS"



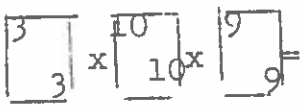
CALCULATOR SOLITAIRE

This game is taken from the Pocket Calculator Game Book by Edwin Schlossberg and John Brockman is reprinted here by permission of the publishers, Wilton House Publications Ltd.
1 Player, 1 calculator, 1 Deck of cards

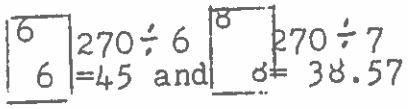
Object of the Game
This game is like solitaire in its aim to eliminate all the cards by pairing up or by matching suits. In this game, however, you must be able to evenly divide a card in order to eliminate it.
The Play
Remove all face cards and jokers from the deck. Make three piles of seven cards each, and turn over the top card of each pile. Multiply the numbers on the top cards together on your calculator. Deal two cards face up. Divide one card into the number on your calculator. It if comes out even, that card can be discarded. Multiply the three top topcards on the three piles again, and divide the product by the other card you turned over. If this comes out evenly, you can eliminate the top three cards and the two cards you turned over. If they do not divide evenly, leave the cards on the three piles and turn over two morecards from the deck. Continue until you have eliminated all the cards. If no pair is found that will divide evenly, you have lost the game.

An example should help to clarify:

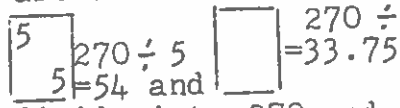
Top Card on each stack



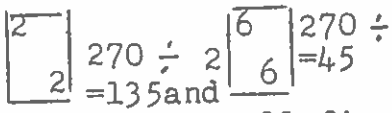
Dealt



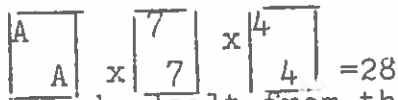
Thus 7 does not divide into 270.Two more cards are dealt.



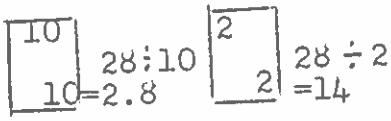
8 does not divide into 270 and two more cards are dealt.



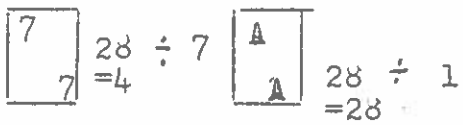
Both divide even ly so all five cards (3,10,9,2,6) are set aside and the next card on each pile turned over revealing:



and the two cards dealt from the pack are:



which does not work. The next two are:



Both divide evenly so all five are set aside. And so it continues until all three stacks are exhausted or no pair will divide the product of the stacks.

This game may be played without the use of a calculator.

A Primary Game

A place value-money game - Old Maid - concept changed to be called "Cento" where the pupl must get a pair of cards for a point that match. A deck of 48 cards can be made.

e.g.



From: S. Torrie
Stoneybrook P.S.

Which of the following could be paid with three <u>different</u> coins?

30¢	56¢	42¢
52¢	45¢	85¢
70¢	86¢	90¢
36¢	75¢	95¢

Which of the following could be paid with four <u>different</u> coins?

75¢	$1.05	16¢
51¢	95¢	66¢
37¢	90¢	44¢
81¢	$1.06	31¢

These may help you in making your cards for Cento

The Fly Problem
There are two flies in a quart jar. They double themselves every 24 hours, and at the end of ten days the jar is full. There are 2 048 flies in the jar. When (what day) was the jar half-full?

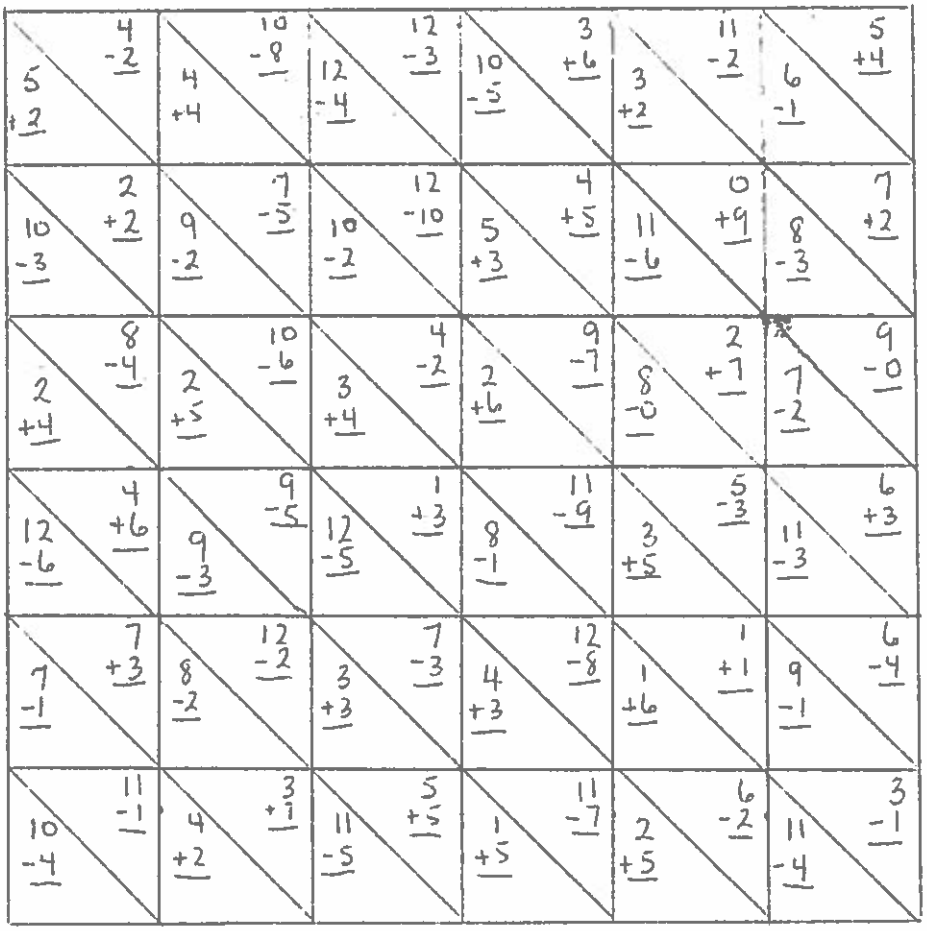
Isabel Racher,
Centennial School
Lambton Co. Bd. of Ed.

BACK TO BASICS

The mathematics teachers of 1977 have heard this cry from the public for the past year and will continue to hear it. Perhaps they should hear it until they do something about it. Below are a few samples of drill sheets that have appealed to a class of children in a rural school in the western part of our province.



CAN YOU RIDE THIS WILD, BUCKING BRONCHO? IF YOU MAKE A MISTAKE HE WILL BUCK YOU OFF. HE MAY EVEN STAMP ON YOU'.



If answer is 9 color blue

if answer is 5 color pink

if answer is 8 color red

if answer is2 color green

if answer is 7 color brown

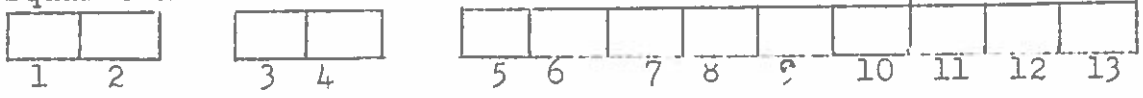
if answer is 4 color orange

if answer is 6 color purple

if answer is 10 color yellow

E. Steadman
Centennial School
Lambton Co. Bd. of Education

Calculate each of the questions. Using the code, place the letters in the squares above.



A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
4	5	11	19	12	21	18	16	17	26	13	2	1	6	20	22	9	24	25	10	23	3	8	14	7	15

1. 12 - 7 = ☐ 5. 10 - 7 = ☐ 9. 12 - 6 = ☐ 13. 24 - 12 = ☐
2. 18 - 2 = ☐ 6. 9 - 5 = ☐ 10. 14 - 4 = ☐
3. 6 - 5 = ☐ 7. 15 - 13 = ☐ 11. 22 - 5 = ☐
4. 14 - 7 = ☐ 8. 16 - 4 = ☐ 12. 14 - 8 = ☐

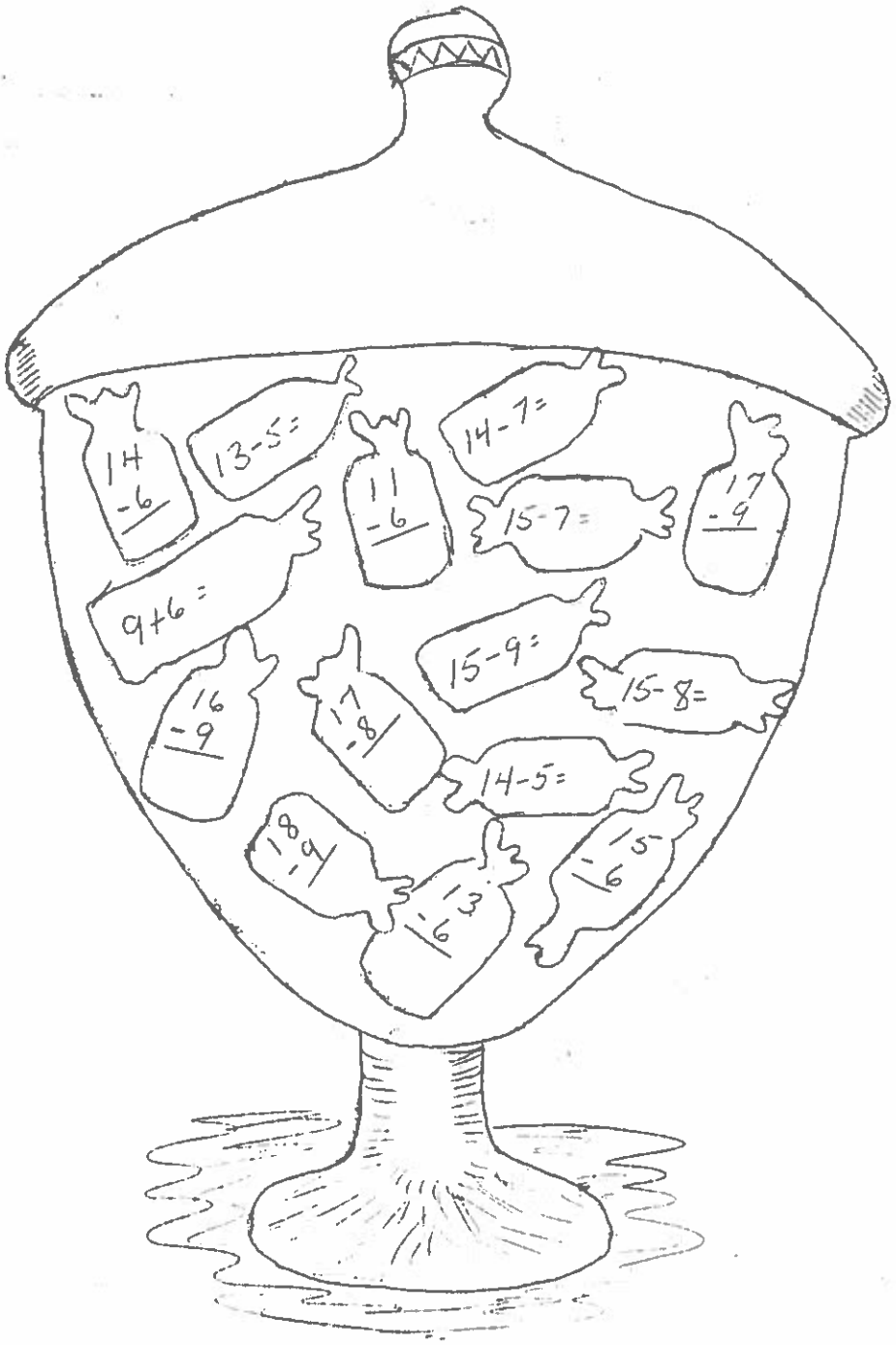
Subraction Facts

Sharon & David McPhail
Lambton Co. Bd. of Ed.

Isabel Racher
Centennial School
Lambton Co. Bd. of Ed.

INSTRUCTIONS

1. Find the answers to the questions in the dish
2. Write all your answers in the lid of the candy dish. Spread them around.
3. Dra. w this shape △ so that the answers divisible by 3 are inside the shape.
4. Draw this shape □ so that the answers divisible by 4 are inside this shape.
5. Draw this shape ⬠ so that the answer divisible by 5 are inside the shape.
6. Is there any answer inside 2 shapes?
7. For the remaining answers draw the correct shape.

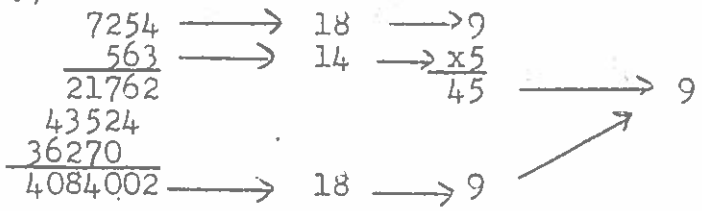


submitted by: Jim McKellar
Peter Askey
Hillcrest School LCBE

Check that Multiplication ..... in FIVE seconds!

This is an accurate, convenient method for checking multiplication answers which can be mastered by students to the point that answers can be checked in a matter of seconds. There is little doubt that you will be considered a "Wizard of Math" the day you introduce this in yourclassroom. Since the basis of the checking is to reduce all totals to single digit numbers we call this "Casting out 9's".

Steps:
(1) Multiply 7254 by 563 to arrive at the product 4084002
(EG.)



(2). Add horizontally the digits of the multiplicand, multiplier, and product to arrive at the sums: 18, 14, 18
(3) Wherever there is a two digit answer, add horizontally again. Thus, 9, 5, 9
(4) Multiply thetwo digits of the multiplicand line and the multiplier to give the new product 45.
(5) Add horizontally until a single digit sum is reached.
(6) When the sum of the two "product" lines is the same, your answer is correct.

Now try some other questions.

Another drill device and discovery

Multiply every number in column 1 by every number in column 2

Column 1	Column 2	
1	3	How many different numbers do you need to find all the products? List them.
2	6	
3	9	
4	7	
5	2	
6	5	
7	8	
8	1	
9	4	

Find the pattern of the answers not common for the various multiplication facts from 1 to 9.

Answer
Multiplication Tables 1, 2, 3, 4, 5, 6, 7, 8, 9
Different answers 9 5 4 4 5 3 3 2 1



Do you agree with this pattern? Perhaps you can develop others/

PROBLEMES: RAPPORTS ET PROPORTIONS

1. L élève, le plus grand d'une classe mesure 175 cm alors que le plus court mesure 135 cm. Servez vous de rapport pour exprimer la mesure du plus court a celui de plus grand.

2. Si le "canadien" gagne 5 parties pour chaque 8 parties jouées, combien de parties gagnera-t-il s'ils en jouent 56?

3. Une certaine assurance-vie est offerte a $21.00 pour chaque $2000.00 d'assurance. Combien coûtera une assurance de $16 000.00?

PROBLEMES DE POURCENTAGE

1. Le salaire annuel de Paul est $10 210 et ses dépenses sont réparties comme suit:

nourriture	23%
vêtements	11%
loyer	14%
épargne	16%
loisirs	6%
transport	10%
divers	20%

Combien est alloué à chaque item?

2. 40% des étudiants d'une école assistent à une partie de ballon-panier et 60% des spectateurs sont des filles. Si 1200 étudiants fréquentent l'école, combien de garçons assistent à la partie?

3. Si la taxe de vente est 7%, combien doit-on payer pour un radio de $16.97?

4. Une année après son achat une auto perd environ 30% de sa valeur originale. Après un an, combien vaut une auto valant $5500 à l'achat?

PERIMETRE

1. Quelle est la longueur de chacun des côtés d'un carre dont le périmètre mesure 136 mètres.

2. Trouve la largeur d'un rectangle si le périmètre mesure 30 cm et la longueur mesure 8 cm.

3. Un couloir de curling mesure 45 mètres de long et 5 mètres de large. De combien de mètres carrés de surface doit-on disposer si l'on veut installer 18 couloirs?

-CAHIER D'EXERCICE DES ECOLES
DE PRESCOTT-RUSSELL

The office of OAME would welcome a page in the French language for March Abacus for Primary Teachers. Send by Feb. 20.

INDIVIDUAL ACTIVITIES

ALPHAMETICS

Here we have another "doubly-true alphametic.

Each letter stands for a different figure, but our SEVEN is exactly divisible by 7.

What must this SEVEN be?

```
  THREE
  THREE
+   ONE
-------
  SEVEN
```

Check your solution.

Find two more solutions where SEVEN is not evenly divisible by 7.



THE ABACUS
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Sarnia, Ont.,
N7T 4E9

Robert Tuck
247 Lee Drive,
North Bay, Ont. P1A 3J2