

Mathematics Council

The Alberta Teachers' Association



February, 1970

MATH-BIN

Dear Fellow Member:

Enclosed is a set of ideas which may have some value in the classroom. It is hoped that this collection will inspire you to submit at least one item for a future issue of the Math Bin.

Also welcome are:

Tips on the Use of Overhead Projectors,
Ideas for Math Labs,
Ideas for Improving Math Teaching,
Reports on Students' Evaluations of Math Courses,
Multiple Choice Tests on Various Topics, etc.

A challenge is made to Edmonton and Northern Alberta members to submit enough material for publication in March. Contributions from other members for this issue, however, are certainly most welcome.

Ideas may be sent to:

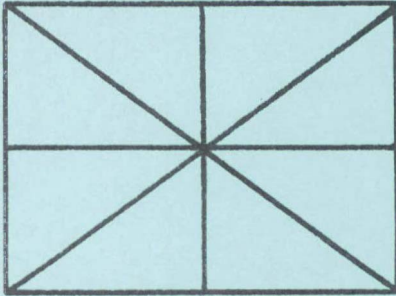
J. Shygal,
Box 571,
Vulcan, Alberta.

Yours sincerely,

The Editor.

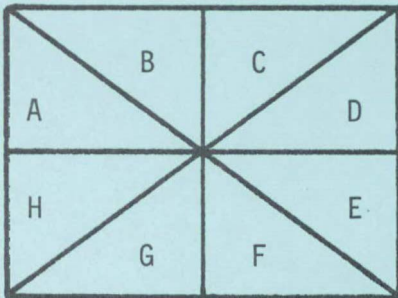
BAKER'S DOZEN

1. PUZZLE



How many triangles do you see?

Solution:



AH, AHGF, BC, BCDE, CBAH, DE, DEFG, FG.

2. PUZZLE

How many squares are there on a checker board?

3. OBSERVATION

(x,y) is an ordered pair. Just as x comes before y in the alphabet, the first letter in "domain" comes before the first letter in "range". Can you find any other coincidences in mathematics?

4. SHORTCUT

Can you suggest a shortcut for multiplying

(a) 25×25

(b) 35×35

(c) 95×95

Solution:

(a), (b), and (c) end with 25

(a) Multiply 3×2 . $25 \times 25 = 625$

(b) Multiply 4×3 . $35 \times 35 = 1225$

(c) Multiply 10×9 . $95 \times 95 = 9025$

5. A SURPRISING RESULT, but only if you multiply correctly.

Take any number of 6 digits.

Multiply it by 99.

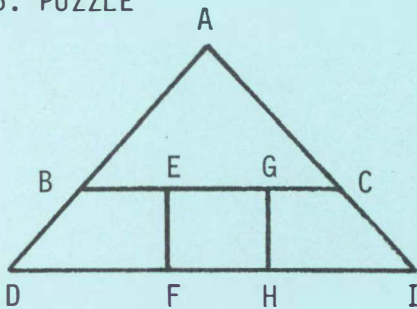
Multiply this result by 10101.

Add to this double the original number.

What is the surprising result?

e.g. If you start with 539247, the result should be 539247539247.

6. PUZZLE



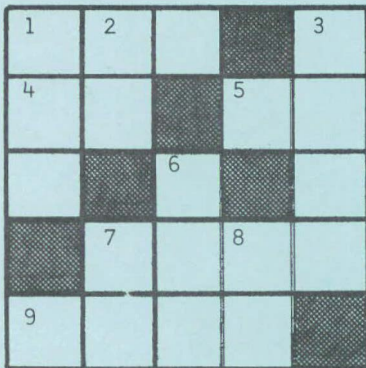
Can you draw a curve passing through AB, AC, BE, BD, DF, EF, EG, GC, GH, HI, FH, and CI once and only once without raising your pencil once you start?

7. CONSECUTIVE LETTERS

One word with two consecutive letters in the alphabet is abs e n t. How many words can you suggest which have two pairs of consecutive letters? One such word is gh o st.

8. MATH CROSSWORD PUZZLE

Use digits to solve this puzzle.



Across

1. The square of a certain number
4. Number of square inches in $1/3$ sq. ft.
5. Number of pounds in 1 stone
7. Number of cu. in. in 1 cu. ft.
9. Number of feet in 1 mile

Down

1. Number of acres in 1 section
2. 100 cu. ft. less than the number of cu. ft. in 1 cord
3. Four consecutive even numbers
6. The number of feet per second equivalent to 60 m.p.h.
7. The product of two certain consecutive integers
8. One score

9. WORDS FROM A WORD

(a) In one minute, how many words can you make using only the letters in MATHEMATICS (any number of times).

e.g. ATTIC, ATTICS, MATHEMATICS, SIT

(b) In five minutes, how many sentences can you make?

e.g. HE ATE A HAM.

10. PATTERNS

Can you find a pattern for multiplying

(a) $(60 + 5)(60 - 5)$, $(40 + 6)(40 - 6)$, $(30 - 3)$, $(30 + 3)$?

Use this pattern for multiplying

$(77)(83)$, $(24)(16)$, $(54)(46)$

(b) $(60 + 4)(60 + 4)$, $(70 + 2)(70 + 2)$, $(30 + 6)(30 + 6)$

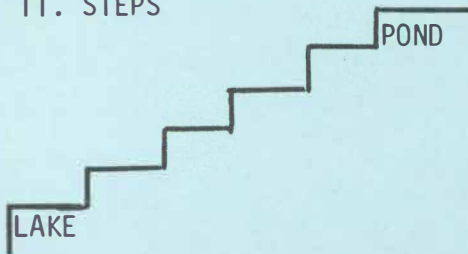
Use this pattern for multiplying

$(57)(57)$, $(38)(38)$, $(51)(51)$

Solution: (a) $(a + b)(a - b) = a^2 - b^2$

(b) $(a + b)(a + b) = a^2 + 2ab + b^2$

11. STEPS



Can you climb from LAKE to POND using 5 steps?
(In each step change only 1 letter. e.g. WOOL
to WOOD is one step).

12. ORDERED TRIPLETS

Suppose you use the lower left corner of a classroom as the origin and (x,y,z) is an ordered triplet in which x tells you how many feet to move a point directly forward from the origin, y tells you how many feet to move it directly to the right, and z tells you how many feet to move it straight up. Where would $(-10, 0, -5)$ take the point?

13. CALCULUS

Perhaps it would be advantageous to set up exercises such as the following to precede rate problems. Some students work blindly otherwise.

Given one of the completed items and required the other completed item, what is the missing item?

$$D_t a = D_b a \cdot D ?$$

$$D ? = D_r c \cdot D_t r$$

$$D_t A = D ? \cdot D_t L$$

$$D_t P = D_t n \cdot D ?$$

$$D_t m = D ? \cdot D_t n$$