DO YOU KNOW... ? ? ?

MARCH 18, 1958
Brief #158

this Octal Multiplication Table???

	1	2	3	4	5	6	7
1	1	2	3	4	5	6	7
2	2	4	6	10	12	14	16
3	3	6	11	14	17	22	25
4	4	10	14	20	24	30	34
5	5	12	17	24	31	36	43
6	6	14	22	30	36	44	52
7	7	16	25	34	43	52	61

Multiply these two octal numbers in your head. Use the table above for reference.

362 x 513 = ? (Answer will be given next week.)

The Marchant Binary-Octal calculator performs these multiplication with ease.

There are many problems connected with the use of the decimal system in an electronic computer. Because of these problems our system of counting using the nine arabic symbols and zero is sometimes modified considerably in order to adapt the computations to machine operation. The Binary system of counting is frequently used. This system uses two symbols, 1 and 0. The Octal system is another. It uses eight symbols – the arabic digits 1 through 7 and 0.

DECIMAL	OCTAL	BINARY
1	1	001
2	2	010
3	3	011
4	4	100
5	5	101
6	6	110
7	7	111
8	10	1000
9	11	1001
10	12	1010

Reference: ARITHMETIC OPERATIONS IN DIGITAL COMPUTERS by R. K. Richards, published by D. Van Nostrand Company, Inc.

DO YOU KNOW... ? ? ?

MARCH 25, 1958
Brief # 159

the Solution to last week's octal multiplication problem???

If you had the Marchant Binary-Octal calculator on your desk, you had the answer in the time it takes you to read this sentence. Here is how it looks on paper:

```
     362
     513
    ----
    1326
    362
  2272
  ------
  234,346
```

Remember, there are no symbols for the arabic digits 8 and 9, they are non-existent in the octal system.

8 is represented as 10
9 is represented as 11
8 x 8 is represented as 100

It is not only possible to add, subtract, multiply and divide octal numbers on the Marchant Binary-Octal calculator, it is also possible to convert octal numbers to their decimal equivalent and decimal numbers to their octal equivalent.

The Marchant Binary-Octal calculator was designed to be used in conjunction with electronic digital computers using the binary counting system.

The United States Senate consists of two Senators from each of the forty-eight states or ninety-six individuals. Supposing that on a certain day a roll-call was taken to determine how many favoured a tax cut and how many opposed a tax cut. The tally might look like this if all were present and voted:

FOR:	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 ||	52
AGAINST:	卌 卌 卌 卌 卌 卌 卌 卌 ||||	44
	Total	96

If this had been the old Roman Senate, instead of summarizing the tally sheet by using the arabic symbols 52 and 44, the figures would have been written LII and XLIV, total XCVI.

Let us make another supposition. Suppose that men only had four fingers on each hand instead of five. Let us take the same vote again. The same number of votes would be cast by the same number of senators. But the tally now might look like this:

FOR:	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌	64
AGAINST:	卌 卌 卌 卌 卌 卌 卌 卌 卌 卌 卌	54
		140

If men had had only four fingers, our present counting system might have been the octal (base 8) instead of the decimal (base 10) system. If this had been the case, the total votes cast FOR would be written as 64 (six "eights" plus four units) and the votes AGAINST as 54 (five "eights" plus four units) and the total for and against would be represented by the written symbols 140. What do you think would have happened to the Roman numbering system?

NOTICE: The number of senators and the number of votes cast for or against remained unchanged. The symbols used to represent these facts on paper are changed.
One of the best discussions of numbers highlighting for nonspecialists the interest that is inherent in mathematics itself and of fostering an appreciation of its place in modern life is LIVING MATHEMATICS by Underwood and Sparks published by the McGraw-Hill Book Co., Inc.