MATHEMATICS (BE IN IT) COMPETITION

REPORT ON COMPUTER NUMBER 4

Readers were asked to turn their calculators to literary ends and to fill the numbers supplied by Messrs H.P. and T.I. with previously unsuspected meanings.

First prize of $3 goes to Andrew Jenkins, Year 8, North Sydney Boys' High School who constructed the examples in Parabola, Volume 16, Number 1. For example, to see whether the LOG button on your calculator is working, set the calculator to display two decimal places and compute

log 1174897551

and read the display upside down. Andrew has now revealed some more examples of his novel self-checking system. (All these examples are to be read with the display right way up.) First set the calculator to display zero decimal places and compute

$\sqrt{2500}$.

A little imagination and half-closed eyes will readily see "0." as "Q". Next, set the calculator to display four decimal places and calculate

sin 30.7771328 (degrees), or sin 0.537162 (radians)

and

$\sin^{-1}$ (10.026381081) (degrees), or $\sin^{-1}$ (− 0.99825432) (radians).

Of course, you will see "17" as "N".

Second prize of $2 goes to Stan Petrovski, Year 12, Waratah High School, who sent in a list of 124 numbers which become more or less ordinary words when read upside down. One of the nicest is

.5317707.

He also sent us "A Sad Tale" from the Newcastle Mathematical Association School Mathematics Journal of September 1978. In similar vein, you can reconstruct the following enthralling facts by reading the answers to the calculation upside down:

631×56 $(615)^2 + 581$

$3 \times 5 \times 23$ $5(107)^2 + (70)^2/10$ $(155)^4 + 145038$

$N(51^2 - 31^2 - 40)$ $6 \times 1289/10^5$

Third prize of $1 goes to Kieran Lim, Year 12, St. Ignatius College, Riverview, who sent in a strange and so far unconfirmed account of recent international events. Set your calculator to display zero decimal places and then read on.

War in the oil lands

At day-break, 5.27 a.m.,	527
432 communist war-planes	+ 432
from 36 squadrons	× 36
attacked 9 oil-wells	+ 9
When the 6th Fleet reacted	× 6
by launching 49 planes,	× 49
the Warsaw Pact called for a boycott of the Los Angeles Olympics	− 1984
Meanwhile, in a well-coordinated attack, 2377 Palestineans charged the derricks	+ 2377
only to be repelled by 858 British maintenance staff	+ 858
In a 7 day battle,	× 7
total casualties were 330 dead	− 330
from the 4 forces involved.	+ 4
	?

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SOLUTIONS TO H.S.C. CORNER BY TREVOR

Problem 80.7 Obviously (explain why!) the best chance for the captain is to split the defences. The probabilities are as follows:

Choice one: Both missiles attack plane A, and both guns attack plane B. The chance of not hitting A is .01 and not hitting B is .2 × .2 = .04. Therefore the probability of hitting A is .99, and B is 0.96, and the probability of hitting both is 0.99 × 0.96 = 0.9504.

Choice two: On the other hand, if he splits the missiles and guns, and has a gun a missile attack each plane separately, then the probability of hitting them both is 0.98 × 0.98 (using the result in 80.4) = 0.9604. Thus the best chance for the ship is to attack each plane with a gun and missile, the probability of survival being 0.9604. Now you know why modern Navy ships have to have a computer on board to assist in decision making!

Problem 80.8 It is best to enumerate each case: The total number of ways of filling the committee = C_7^{13} = 13!/(6! 7!) = 13.12.11.

There are 4 possibilities; the committee comprises

a) all girls — number of ways is 0.
b) 6 girls, one boy. $C_6^6 \times C_1^7 = 7$ ways.
c) 5 girls, 2 boys. $C_5^6 \times C_2^7 = 6 \times 7 \times 3 = 126$ ways.
d) 4 girls, 3 boys. $C_4^6 \times C_3^7 = 15 \times 35 = 525$ ways.

Therefore the total number of ways to make up the committee is

$$7 + 126 + 525 = 658$$

Therefore the probability that the committee has a girl majority is

$$\frac{658}{13.12.11} = \frac{329}{858}.$$