? ? ? Problem Corner ? ? ?

edited by William J. Bruce and Roy Sinclair
University of Alberta, Edmonton

Problems suggested here are aimed at students in both the junior and senior high schools of Alberta. Solutions are solicited, and a selection will be made for publication in the next issue of *delta-K*. Names of participants will be included. All solutions must be received (preferably in typewritten form) within 60 days of publication of the problem in *delta-K*.

The Department of Mathematics, University of Alberta, has made prize money available for solutions: First Prize - $15; Second Prize - $10. Decision of the editors is final.

Mail solutions to: Dr. Roy Sinclair or Dr. Bill Bruce
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Problem 8:

(submitted by Roy Sinclair, University of Alberta)
Reprinted from the March 1982 issue of delta-K.

A fly is located 1 m from the ceiling and in the middle of one end of a room. A hungry spider is located in the middle of the other end of the room and 1 m from the floor. Find the shortest path that the spider can take along the surface of the room to get to the fly if the room is 20 m long, 10 m high, and either (a) 10 m wide or (b) 15 m wide.

HINT: Unfold the room surface in each case to lie flat on a plane and solve both problems.

Problem 9:

(submitted by Roy Sinclair, University of Alberta)

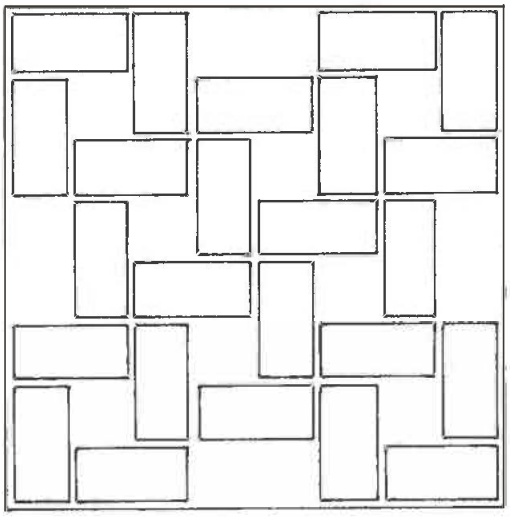
Use your hand-held calculator to solve the equation $\theta_n = \cos \theta_{n-1}$, $n \geq 1$ *either* in degrees *or* in radians. Indicate the program that you used and

obtain the answer correct to eight figures. Include a sketch of the portion of the graph, which is involved, so as to show how to zero in on the point of intersection of the line and the curve.

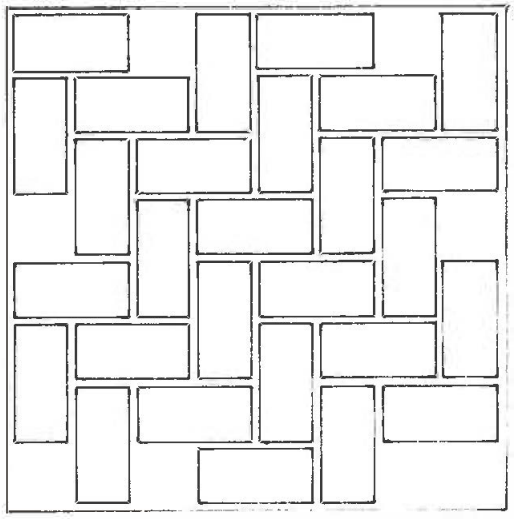
NOTE: This problem can be thought of as a calculator-assisted treasure hunt in which the hidden treasure is located at the point of intersection.

Solution to Problem 7:

(by William J. Bruce, University of Alberta)



(a) Right angle butting only. Minimum space unused - 16 squares.



(b) Right angle butting and semi-adjacent parallelism. Minimum space unused - 8 squares.

Note: It has been shown that these are the minima.

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