# Puzzle Corner

Hi, I should like to introduce myself. My name is Allan Gottlieb and I reside at Baker House, room 632. As your puzzle editor, I have the honor and privilege (or so I was told) to see that TEN has several puzzles each issue. Being a basically lazy individual, I would prefer to be deluged with puzzle suggestions. If necessary, however, I have a supply of my own. I will print solutions in the second issue following the one in which the problems are published. I shall try to give, in each issue, problems of varying difficulty. The name of any one who sends to me a correct solution will appear with the published solution (sorry, no partial credit). So to snow your date, to make the grad schools come crawling, and to make me feel that someone reads my column, send in your solutions. Send them via institute mail to Baker House 632. If you have a nickel you wish to get rid of, send the solution via US mail to me at Box 632, 362 Memorial Drive, Cambridge 39, Mass. If for some reason you feel an urgent need to speak to me, try dorm line 8-482 or institute extension 3161.

1) Consider the triangle:

1 1/2 1/3 1/4 1/5 . . .
1/2 1/6 1/12 1/20 . . .
1/3 1/12 1/30 . . .
1/4 1/20 . . .
1/5 . . .

Each term is the difference of the two terms diagonally above it. Turn the triangle sixty degrees clockwise such that the apex is 1. Then divide through by the number at the end of each row to get:

1
1 1
1 1/2 1
1 1/3 1/3 1
1 1/4 1/6 1/4 1

Take reciprocals. Prove that the end result is Pascal's triangle.

2) On an 8 x 8 chessboard what is the maximum number of a) king, b) queens, c) bishops, d) knights, and e) rooks that can appear without having any piece able to capture any other. Draw diagram for each of the five parts.

The next problem is an adaptation of a problem given to Eta Kappa Nu pledges by Ed Fiala. Since this is an *E.E.* honorary, math majors are morally obligated to outperform the pledges. In order to insure a good showing, I will surely grade this problem leniently (we math majors must stick together).

Harvies swim ashore to a desert island with three young college girls, from Wellesley, Smith, and Radcliffe. The M.I.T. men have decided after long discussion, to share the broads on a time-sharing basis. They wish to keep the girls away from the Harvies whom they hate bitterly. The Harvies have made a similar decision with respect to the M.I.T. men and the girls. Currently the girls are on different corners of the triangular island and impatiently waiting the outcome of the imminent struggle. Suppose the M.I.T. men have decided to base their actions on a utilitarian system of values which assigns

1 point for each girl taken

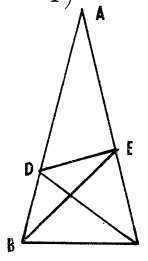
1 point for each Harvie killed so he won't cause trouble later (*capitalistic war mongers -ed.*).

The two groups are going to split in some fashion so that by dawn each of the men will be near one of the girls. At dawn the Tech men and the Harvies will fight to the last man over the girls. The group with the most men near a girl will kill the enemies near that girl and will also capture her. If both groups send the same number of men to the girl, no points will be awarded. Assume each side plays rationally, i.e., no team sends anyone to the Cliffy. The other two girls are equally sexy and, hence, have equal value.

Determine what optimum strategy each side should employ to maximize its expected gain. In other words, what % of the time should the Tech men try each of the following possible divisions: 4-0, 3-1, 2-2, 1-3, 0-4; and what % of the time should the Harvies try 3-0, 2-1, 1-2, 0-3, in order to have the greatest expectation of points.

The following problem was submitted to me by Teddy Chang.

4) Given: ∠ABE 20°
∠EBC 60°
∠DCB 50°
∠ACD 30°

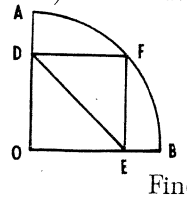



Find: ∠DEB, No trig solutions accepted.

5) If 70xy34z (an integer) is exactly divisible by 792, solve for x, y, and z (each a digit).

Speed Department — Do not bother sending in solutions to these problems. Each problem should take no more than a minute.

6) Given: $\overset{\frown}{AB}$ is a quadrant of circle O. DEFO is a square. The radius of O is r.




Find: DF

7) If a chicken and a half lays an egg and a half in a day and a half, how many eggs do six chickens lay in six days. ■