

COPIES ARE AVAILABLE IN THE MATH LIBRARY

PROBLEM OF THE WEEK

10/25/05 due NOON 11/7/05

CAN YOU GIVE US A SOLUTION?

Problem No. 9 (Fall 2005 Series)

Triangle $T_1 = \triangle A_1 B_1 C_1$ is included in circle K . The perpendicular bisectors are drawn and extended through the interior of T_1 to their intersections A_2, B_2, C_2 with K . This process is repeated with the new triangle $T_2 = \triangle A_2 B_2 C_2$ to get new points A_3, B_3, C_3 , etc.

Prove that

- (a) the sequence T_n has a subsequence that converges to some triangle T_∞ and
- (b) T_∞ must be equilateral.

A panel in the Mathematics Department publishes a challenging problem once a week and invites college & pre-college students, faculty, and staff to submit solutions. The objective of this is to stimulate and cultivate interest in good mathematics, especially among younger students. Solutions are due within two weeks from the date of publication. They can be faxed to (765) 494-0548 or sent by campus or U.S. mail (no E-mail please) to:

PROBLEM OF THE WEEK, **8th Floor**, Math Sciences Bldg., Purdue Univ.,
150 North University St., West Lafayette, IN 47907-2067

Solvers should include their name, address, and **status at the University or school**.

The names of those who submitted correct solutions will be posted in the Math. Library, along with the best solution. Every Purdue student who submits three or more correct solutions will receive a Certificate of Merit. A prize fund of \$150.00 will be distributed among the Purdue undergraduates who have contributed at least six correct solutions for the total fall 2005 series.