## PROBLEM OF THE WEEK Solution of Problem No. 5 (Fall 2002 Series)

**Problem:** Given a triangle  $\triangle ABC$  and points A', B', C', which are midpoints of the sides  $\overline{BC}, \overline{CA}$ , and  $\overline{AB}$ , resp. Prove that the circumcircles of  $\triangle AB'C', \triangle BC'A'$ , and  $\triangle CA'B'$  have a common point.

Solution (by Jason Andersson, Fr. Math)

Draw the perpendicular bisectors of the sides of the triangle. They meet in the circumcenter O. Since  $\angle AC'O + \angle AB'O = 90^{\circ} + 90^{\circ} = 180^{\circ}$ , the points A, B', C', O lie on one circle, which is the circumcircle of AB'C'. Hence O lies on the circumcircles of AB'C', BC'A' and CA'B'.

Also solved by:

<u>Undergraduates</u>: Jason Anema (So. Econ), Ryan Machtmes (Sr. E&AS), Eric Tkaczyk (Sr. MA/EE)

<u>Graduates</u>: Dionysios Aliprantis (ECE), Tom Engelsman (ECE), Prasenjeet Ghosh (ChE) & Dharmashankar Subramanian (ChE), Qi Xu (ChE)

Faculty: Steven Landy (Physics at IUPUI)

Others: Jonathan Landy (Fr., Cal Tech), Yuichi Yamane (Gr. MA, Fukuoka U. Japan)

One incorrect solution was received.

J.L.C. of Fishers, IN faxed to say he sent a solution to Problem 4 which was similar to the published solution. We cannot find it in our file but will credit him with a correct solution.