PROBLEM # 671

Posted on:24 March **Due on**:7 April

(a) Let A_1, A_2, A_3, A_4, A_5 be five points in the plane. Show that

 $2(A_1A_2 + A_2A_3 + A_3A_4 + A_4A_5 + A_5A_1) \ge A_1A_3 + A_2A_4 + A_3A_5 + A_4A_1 + A_5A_2.$

(b) Show that the coefficient 2 in this inequality is the best possible, i.e., there are 5 points A_1, A_2, A_3, A_4, A_5 in th plane such that

 $1.9(A_1A_2 + A_2A_3 + A_3A_4 + A_4A_5 + A_5A_1) < A_1A_3 + A_2A_4 + A_3A_5 + A_4A_1 + A_5A_2.$

The problem of the week can be found online at

http://potw.mth.cmich.edu/ Solutions can be mailed to chakr2d@cmich.edu

with subject line "POTW 671"