Reprinted from Mathematics Magazine 41.1(1968)45.

A Cyclic Quadrilateral

658. [May, 1967] *Proposed by Kaidy Tan, Fukien Normal College, Fukien, China.*

Construct a cyclic quadrilateral so that each side touches one of four fixed circles.

Solution by Stanley Rabinowitz, Far Rockaway, New York.

There are infinitely many such cyclic quadrilaterals. Let the given circles be called C_1, C_2, C_3, and C_4. Construct any cyclic quadrilateral with sides s_1, s_2, s_3, s_4 in the plane. Then construct line t_i parallel to s_i and tangent to C_i, $i=1, 2, 3, 4$. Then the quadrilateral with sides t_i will be cyclic since the sum of two opposite interior angles will still be 180°, and its sides are tangent to the four given circles.