

Four distinct points,  $A$ ,  $B$ ,  $C$ , and  $D$  are given on the shore of a circular lake. Boat 1 and boat 2 are two boats, each of which travels at a constant speed, though these speeds need not be the same for the two boats. Boat 1 leaves point  $A$  and heads straight for point  $C$ . and at the same time, boat 2 leaves point  $B$  and heads straight for point  $D$ . The two boats collide. Prove that if boat 1 had gone to point  $D$  and boat 2 had gone to  $C$ , then they would have arrived at their destinations at the same instant.