



**Example 1 90 :** As shown in Figure 1 , the quadrilateral  $ABCD$  ,  $AC$  intersects  $BD$  at  $O$  , and the feet of  $O$  on the four sides of  $BC$  ,  $CD$  ,  $DA$  , and  $AB$  are  $E$  ,  $F$  ,  $G$  , and  $H$  . Prove: The necessary and sufficient condition for  $AC \perp BD$  is  $E$  ,  $F$  ,  $G$  ,  $H$  are four points in a circle.

Proof: 
$$\frac{\frac{G-F}{G-H}}{\frac{E-F}{E-H}} = \left( \frac{A-C}{B-D} \right)^2 \frac{\frac{G-O}{A-C} \frac{G-F}{D-C} \frac{E-H}{B-A} \frac{E-O}{C-A}}{\frac{G-O}{A-B} \frac{G-F}{D-B} \frac{E-H}{B-D} \frac{E-O}{C-D}}.$$