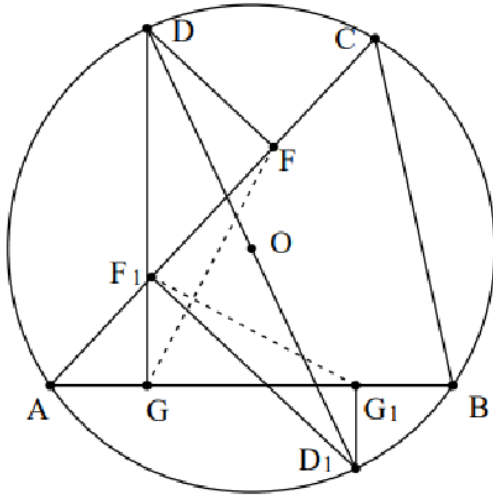


**Example 92 :** As shown in Figure 3, in  $\triangle ABC$ ,  $DD_1$  is the diameter, the feet of  $D$  on  $AC$  and  $AB$  are  $F$ ,  $G$ , the feet of  $D_1$  on  $AC$  and  $AB$  are  $F_1$ ,  $G_1$ , to prove:  $FG \perp F_1G_1$ .



$$\frac{F-G}{F_1-G_1} = \frac{D_1-A}{D-A} \frac{F-D}{D_1-F_1} \frac{A-G}{A-G_1} \left( \frac{F_1-A}{F_1-G_1} \frac{D_1-G_1}{D_1-A} \right) \left( \frac{G-F}{G-A} \frac{D-A}{D-F} \right) \left( \frac{D_1-F_1}{A-F_1} \frac{A-G_1}{D_1-G_1} \right)$$

Generalization: In  $\triangle ABC$ ,  $D$  and  $D_1$  are arbitrary points, and the feet of  $D$  on  $AC$  and  $AB$  are  $F$  and  $G$ , and the feet of  $D_1$  on  $AC$  and  $AB$  are  $F_1$  and  $G_1$ . To prove:  $FG$  and  $F_1G_1$  are perpendicular. The included angle  $\angle F_1G_1$  is equal to  $\angle DAD_1$ .