Example 2 15 : As shown in the figure, circle A and circle B intersect at points E and F, *and there is a point* M on circle B , extend ME and MF to intersect circle A at E_1 and F_1, and prove $E_1F_1 \perp MB$.

$$\frac{M-B}{E_1-F_1}=\frac{\dfrac{F_1-F}{F_1-E_1}}{\dfrac{E-F}{E-E_1}}\left(\frac{E-F}{E-E_1}\frac{M-B}{F-F_1}\right)$$

Example 23 *From the midpoint C of arc AB of a circle, two secants are drawn meeting line AB at F, G, and the circle at D and E. Show that F, D, E, and G are on the same circle.*

Point order: a, c, d, e, o, m, f, g.

Hypotheses: cong(o, a, o, c), cong(o, a, o, d), cong(o, a, o, e), coll(m, c, o), perp(m, a, c, o), coll(f, a, m), coll(f, c, d), coll(g, a, m), coll(g, c, e).

Conclusion: $[ce, fg] + [cd, de]$.

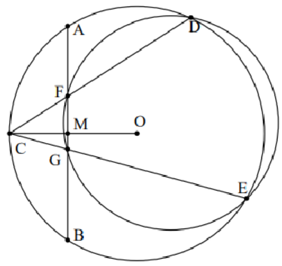

Figure 23

The Machine Proof

$-[gf, ec] - [ed, dc]$

(Since a, f, g, m are collinear; $[gf, ec] = [ma, ec]$.)

$= -[ma, ec] - [ed, dc]$

(Since $ma \perp co$; $[ma, ec] = [oc, ec] + 1$.)

$= -[oc, ec] - [ed, dc] - 1$

(Since circumcenter(o,c, e, d); $[oc, ec] = [oc, ce] = -[ed, dc] + 1$.)

$= 0$