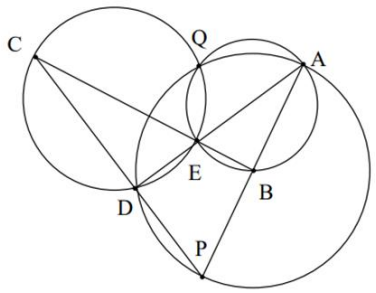
Example 175 : As shown in Figure 3, the straight lines AB and CD intersect at P, AD and BC intersect at E, and the circumscribed circles of $\triangle ABE$ and $\triangle CDE$ intersect at point Q. Prove that the four points A, Q, D, P *share a circle.* (Mick's theorem)



$$\frac{P-D}{P-A}\frac{Q-A}{Q-D}=\frac{P-D}{D-C}\frac{B-A}{P-A}\frac{E-C}{B-E}\left(\frac{Q-E}{Q-D}\frac{C-D}{C-E}\right)\left(\frac{Q-A}{Q-E}\frac{B-E}{B-A}\right),$$