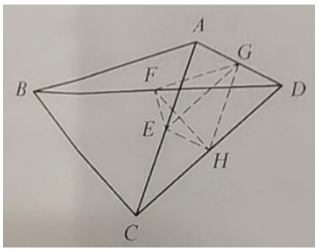

Example 1 42 : As shown in the figure, E, F, G, and H *are the midpoints of* AC, BD, AD, and CD respectively . To prove: ∠ABC = ∠ADC *The* necessary and sufficient condition is that the four points E, F, G, and H share a circle .

$$\frac{\frac{B-A}{B-C}}{\frac{D-C}{D-A}}=\frac{\frac{\frac{C+D}{2}-\frac{A+C}{2}}{\frac{C+D}{2}-\frac{B+D}{2}}}{\frac{\frac{A+D}{2}-\frac{A+C}{2}}{\frac{A+D}{2}-\frac{B+D}{2}}}$$

It is easy to write a new identity equation according to the gourd painting

$$\frac{\frac{B-A}{B-C}}{\frac{D-C}{D-A}}=\frac{\frac{\frac{P+C+D}{3}-\frac{P+A+C}{3}}{\frac{P+C+D}{3}-\frac{P+B+D}{3}}}{\frac{\frac{P+A+D}{3}-\frac{P+A+C}{3}}{\frac{P+A+D}{3}-\frac{P+B+D}{3}}}$$

, and its geometric meaning is:

Example 1 43 : As shown in the figure, point P *is* any point on the quadrilateral *ABCD plane, and* E, F, G, H are the centers of gravity of △ PAC, △ PBD, △ PAD, △ PCD *respectively. To* prove : $\angle ABC = \angle ADC$ The condition is that the four points E, F, G, and H share a circle.