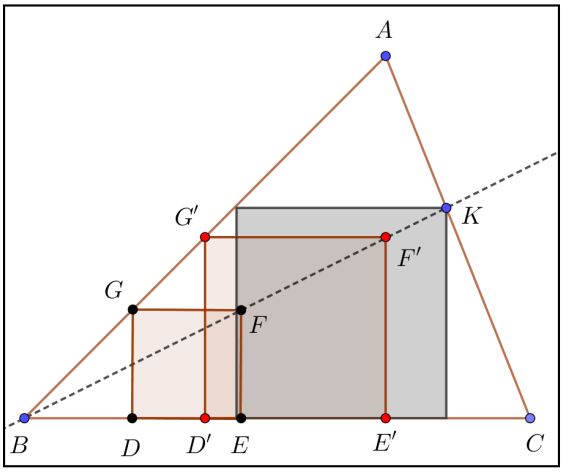
Square in Triangle

#6. Given an acute triangle, construct a square inside the triangle with one edge along a side of the triangle and the two other vertices on the other sides of the triangle.



Construction. Let ABC be the triangle. Because $\triangle ABC$ is acute, a square can be constructed lying entirely within the triangle with one edge along BC and one vertex along AB — this is square $DEFG$ in the diagram, the small one with black points as the vertices. Dilations emanating from point B and with scale factor $k > 1$ map $\square DEFG$ to larger squares still inside the triangle as long as k is small (dilations always map squares to squares). One such square is $D'E'F'G'$ as shown in the diagram — the middle sized one with red points as vertices. Note that all such dilations map points along BA and BC to the rays determined by BA and BC. The points F, F', and so on all lie along a straight line, the diagonal dashed line. This line is between BA and BC, so it eventually intersects segment AC, the opposite side of the triangle. Let this point of intersection be K. Then K is the vertex of a square meeting the conditions of the problem, the gray square as shown, for its base is along BC and its other two vertices lie on the other sides of the triangle. **QEF**.

– Mike Bertrand
September 9, 2026