Pascal's Mystic Hexigon

Theorem. Suppose that an arbitrary (not regular) hexagon is inscribed in a circle. Then if the sides opposite each other are extended so that they intersect. Then the three points of intersection lie in a straight line.

So, if hexagon $ABCDEF$ is inscribed in a circle with $\overline{AB}$ opposite $\overline{DE}$, etc. And if $P = \overline{AB} \cap \overline{DE}$, $Q = \overline{BC} \cap \overline{EF}$, $R = \overline{CD} \cap \overline{FA}$, then the points P, Q and R lie in a straight line.

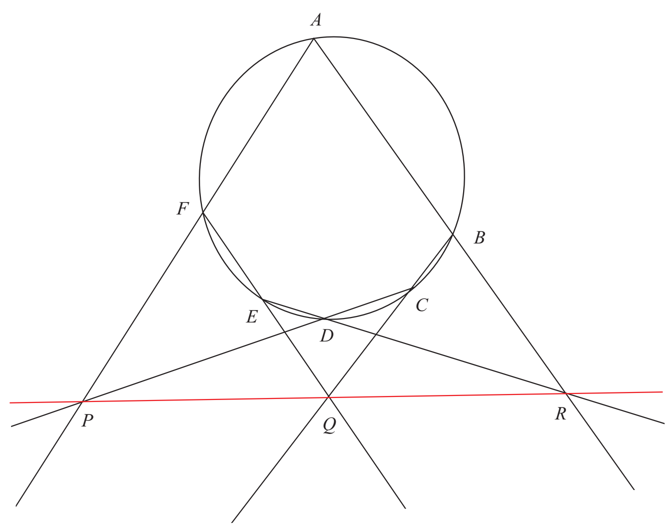

FIGURE 1. Hexagon inscribed in a circle.

Pascal's Theorem. Suppose that an arbitrary hexagon is inscribed in a conic section. Then if the sides opposite each other are extended so that they intersect. Then the three points of intersection lie in a straight line.

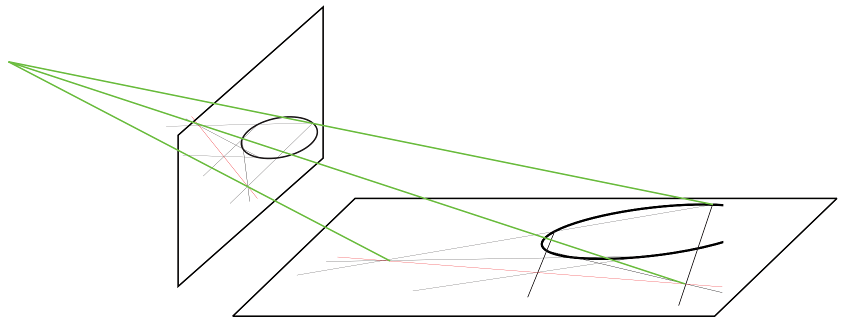

FIGURE 2. Projective Geometry “Proof” of Pascal’s Theorem.