Proof that in the “two tangents, a line, and a point” construction, the conic section is tangent to and at and :

The tangent to the conic at point is *perpendicular* to the gradient at

The gradient is:

For :

Therefore .

In a straight line , the vector is *perpendicular* to the line. Also .

which is a constant multiple of

Therefore, the conic is tangent to at (and ).

Ditto for at and