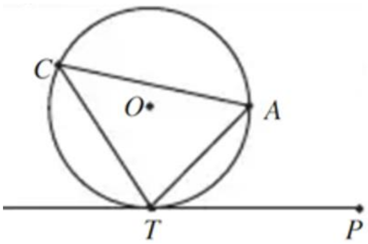

Example 1 83 : As shown in Figure 1 , the theorem of chord cutting angle : the degree of chord cutting angle is equal to half of the angle of the center of the arc subtended by it, and equal to the circumference angle of the arc subtended by it. TA is a chord on the circle O , TP is the tangent, C is a point on the circle, and is on the arc opposite to the chord $\angle PTA = \angle ACT$ AT .

Proof 1: $\angle PTA = 90^{\circ} - \angle ATO = \frac{1}{2}\left(180^{\circ} - \angle ATO - \angle OAT\right) = \frac{1}{2}(\angle AOT) = \angle ACT$.

Proof 2 : $$\left(\frac{\frac{T-A}{C-P}}{\frac{C-A}{C-T}}\right)^2 = -\left(\frac{T-O}{T-P}\right)^2 \frac{\frac{A-T}{A-O}}{\frac{T-O}{T-A}} \frac{\frac{O-A}{O-T}}{\left(\frac{C-A}{C-T}\right)^2}$$

It can be found that the ideas of the two proofs are exactly the same, but the writing is different. The difference seems to be that Proof 1 is more concise. So what is the advantage of Proof 2? The identity formula shows: four conditions $\angle PTA = \angle ACT$, $TO \perp TP$, $OA = OT$, $2\angle ACT = \angle AOT$, if any three are known, it can be determined that the fourth one is also true.