Proposition IV.2

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Prop IV.2: In a given circle, to draw a triangle equiangular to a given triangle

- Let $ABC$ be a circle
- Draw the tangent line to the circle at $A$, call it $GH$
- Construct $\angle HAB = \epsilon$, with point $B$ on the circle (I.23)
- Construct $\angle GAC = \phi$
- $\gamma = \angle HAB$ (III.32)
- $\gamma = \epsilon$ (c.n.1)
- $\beta = \angle GAC$ (III.32)
- $\beta = \phi$ (c.n.1)
- $\alpha + \beta + \gamma$ is equal to two right angles, and so is $\delta + \epsilon + \phi$ (I.32)
- $\alpha + \beta + \gamma = \delta + \epsilon + \phi$
- Subtracting from both sides, we find that $\alpha = \delta$
- QEF