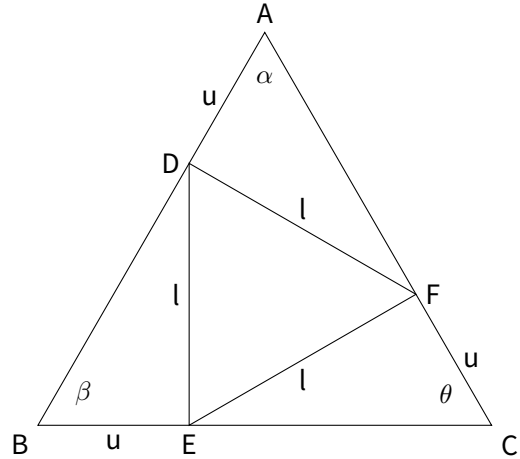


△DEF 为正三角形 AD=BE=CF
 求证 △ABC为正三角形



假设 $\angle\alpha < \angle\theta$

$$\begin{aligned} &\angle\alpha > \angle\theta \\ \because \cos\alpha &= \frac{u^2+|AF|^2-l^2}{2u|AF|} = \frac{u^2+x^2-l^2}{2ux} \\ \therefore (\cos\alpha)' &= (\frac{(u^2-l^2)}{2u}\frac{1}{x} + \frac{x}{2u})' = \frac{(l^2-u^2)}{2u}\frac{1}{x^2} + \frac{1}{2u} \end{aligned}$$

如果 $l > u$, 随着 α 增大 $|AF|$ 减小

$$\begin{aligned} &\angle\alpha < \angle\theta \\ \Rightarrow |AF| &< |CE| \\ \Rightarrow |AC| &< |BC| \\ \Rightarrow \angle\beta &< \angle\alpha \\ \Rightarrow |BD| &> |AF| \\ \Rightarrow |AB| &> |AC| \\ \Rightarrow \angle\theta &> \angle\beta \\ \Rightarrow |CE| &< |BD| \\ \Rightarrow |BC| &< |AB| \\ \Rightarrow \angle\alpha &> \angle\theta \end{aligned}$$