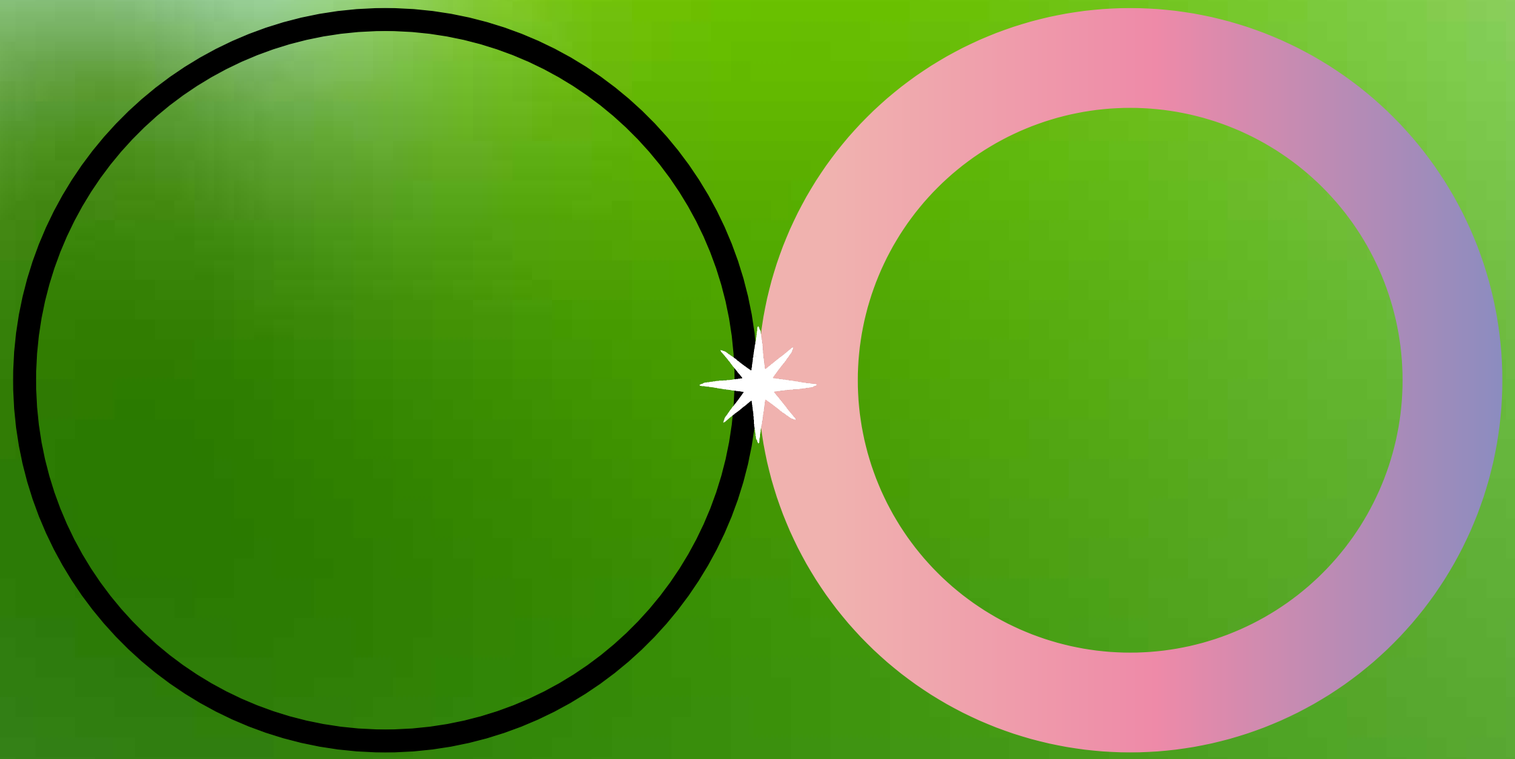

Epicycloid

Let's consider a circle

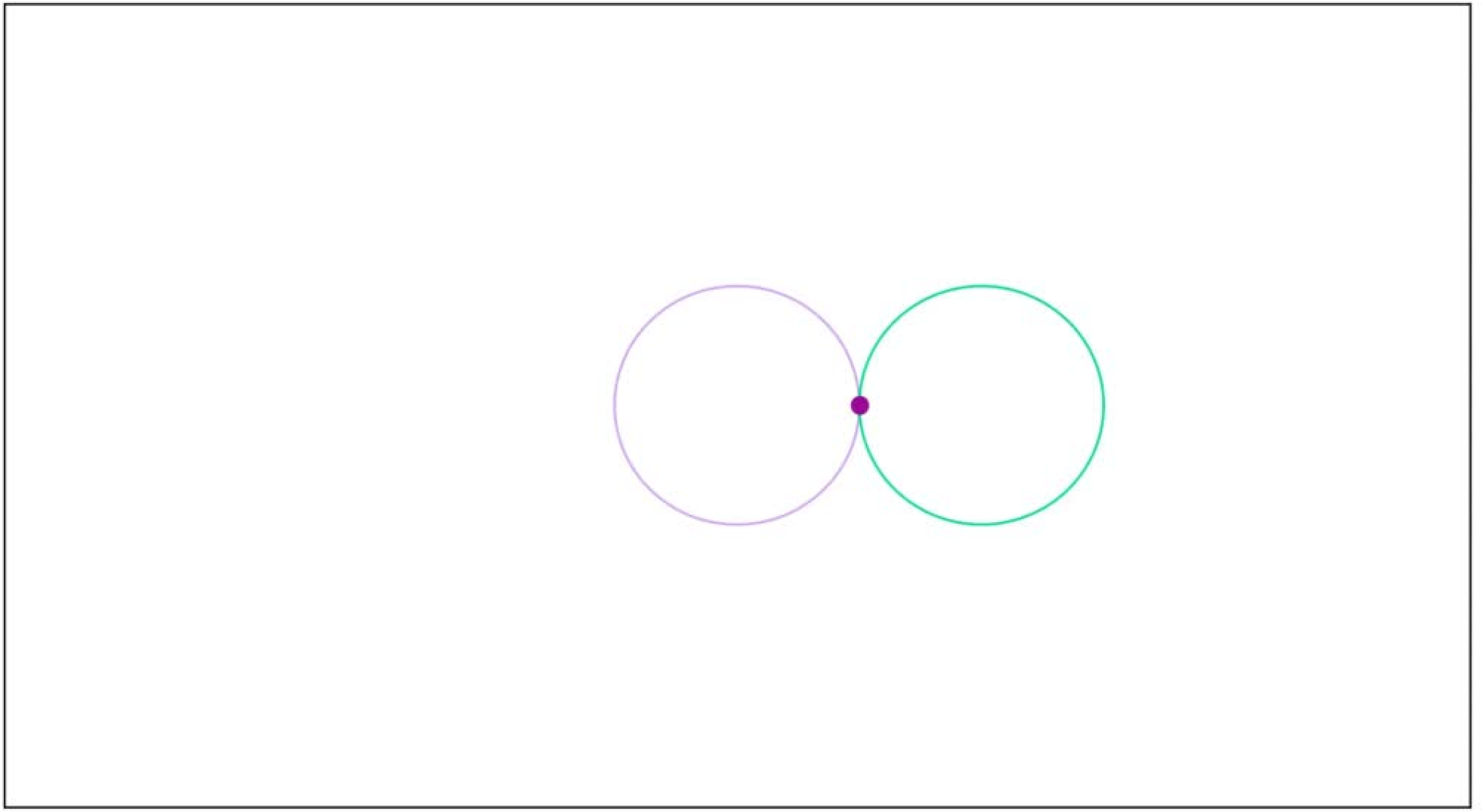
Now another circle of same or smaller radius with a common point



$$k = \frac{\text{Radius of 1st Circle}(R)}{\text{Radius of 2nd Circle}(r)}$$

Follow the common point on the second circle

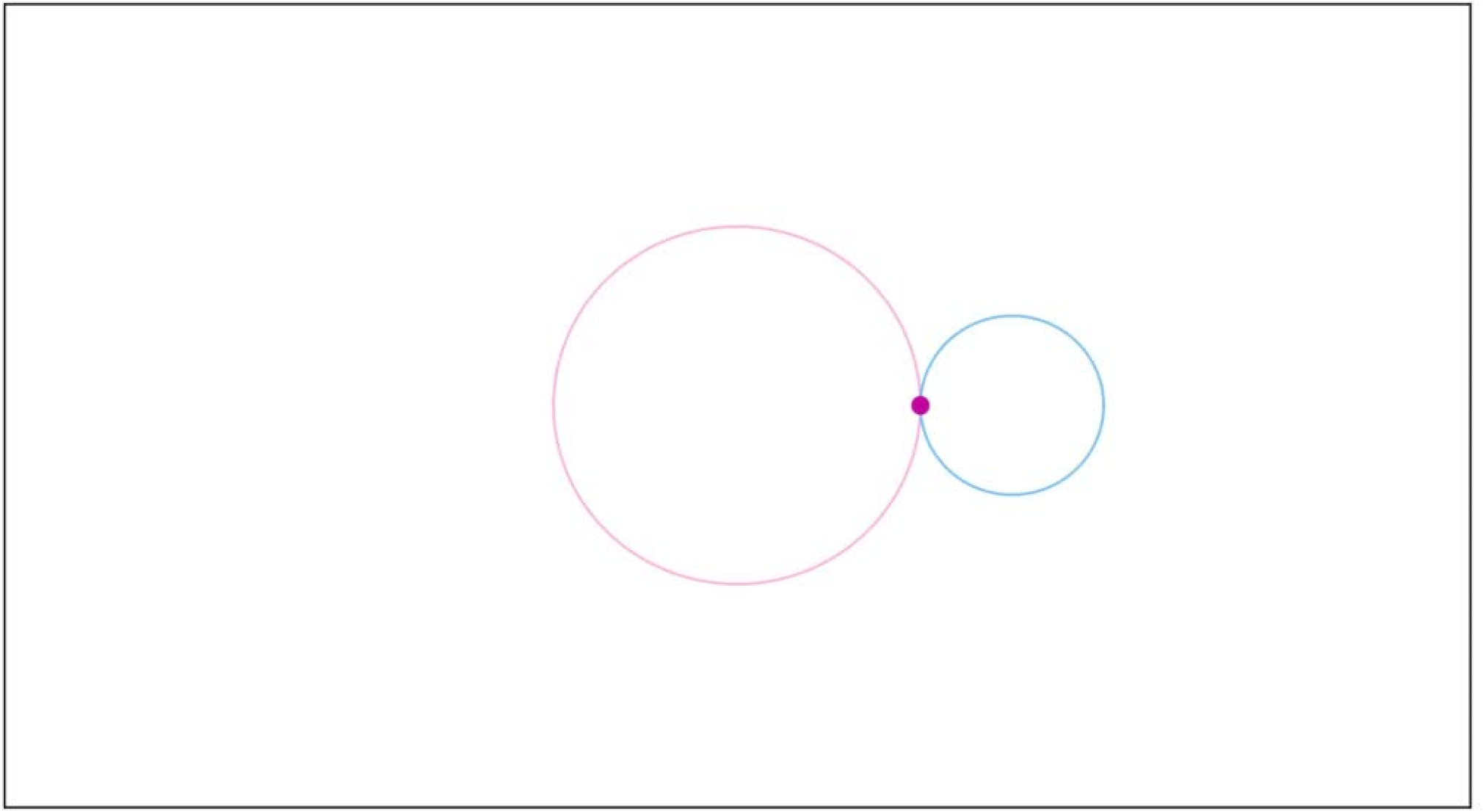
$$k = 1$$



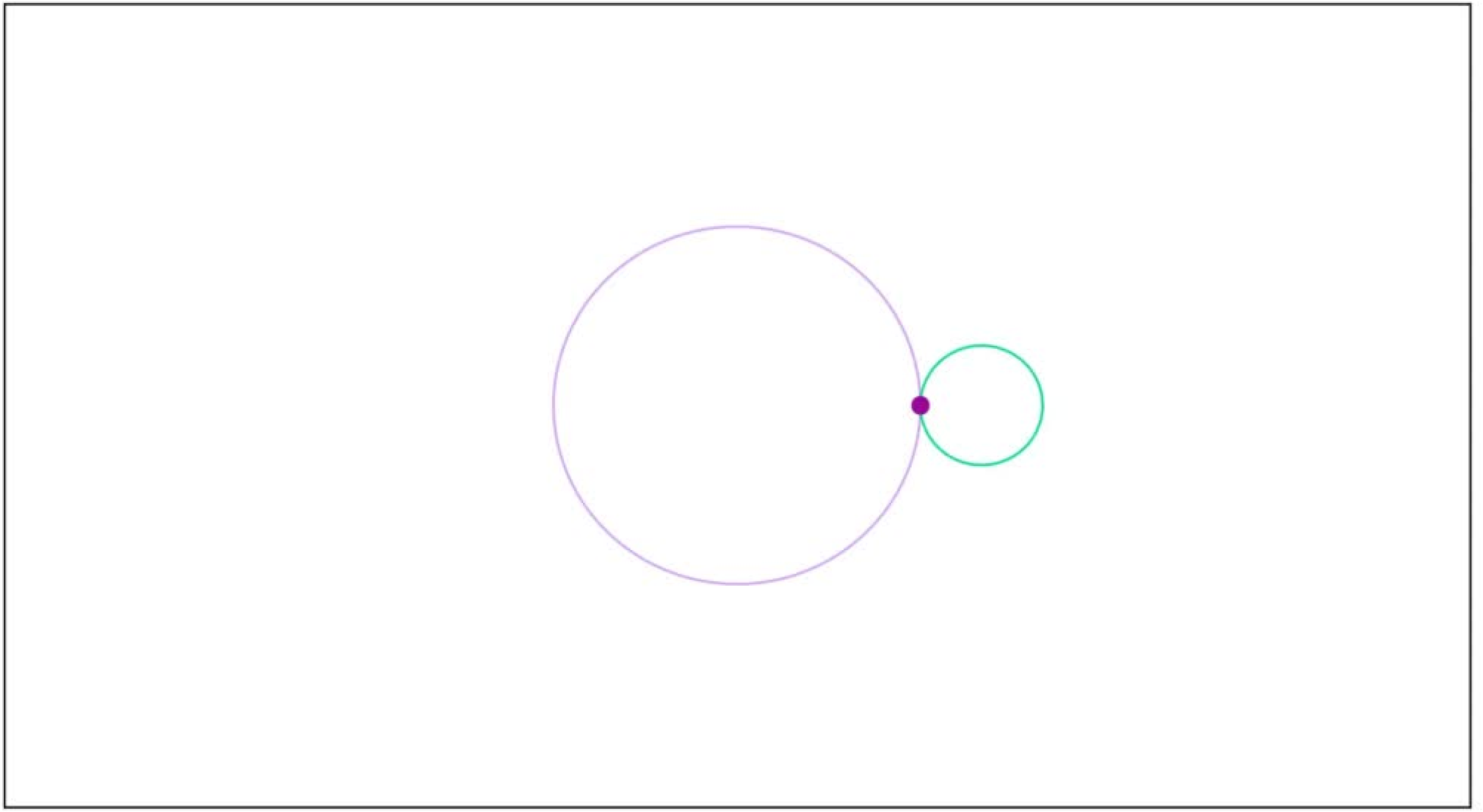
What you got is a Epicycloid

This reduces to a Cardioid for $k = 1$

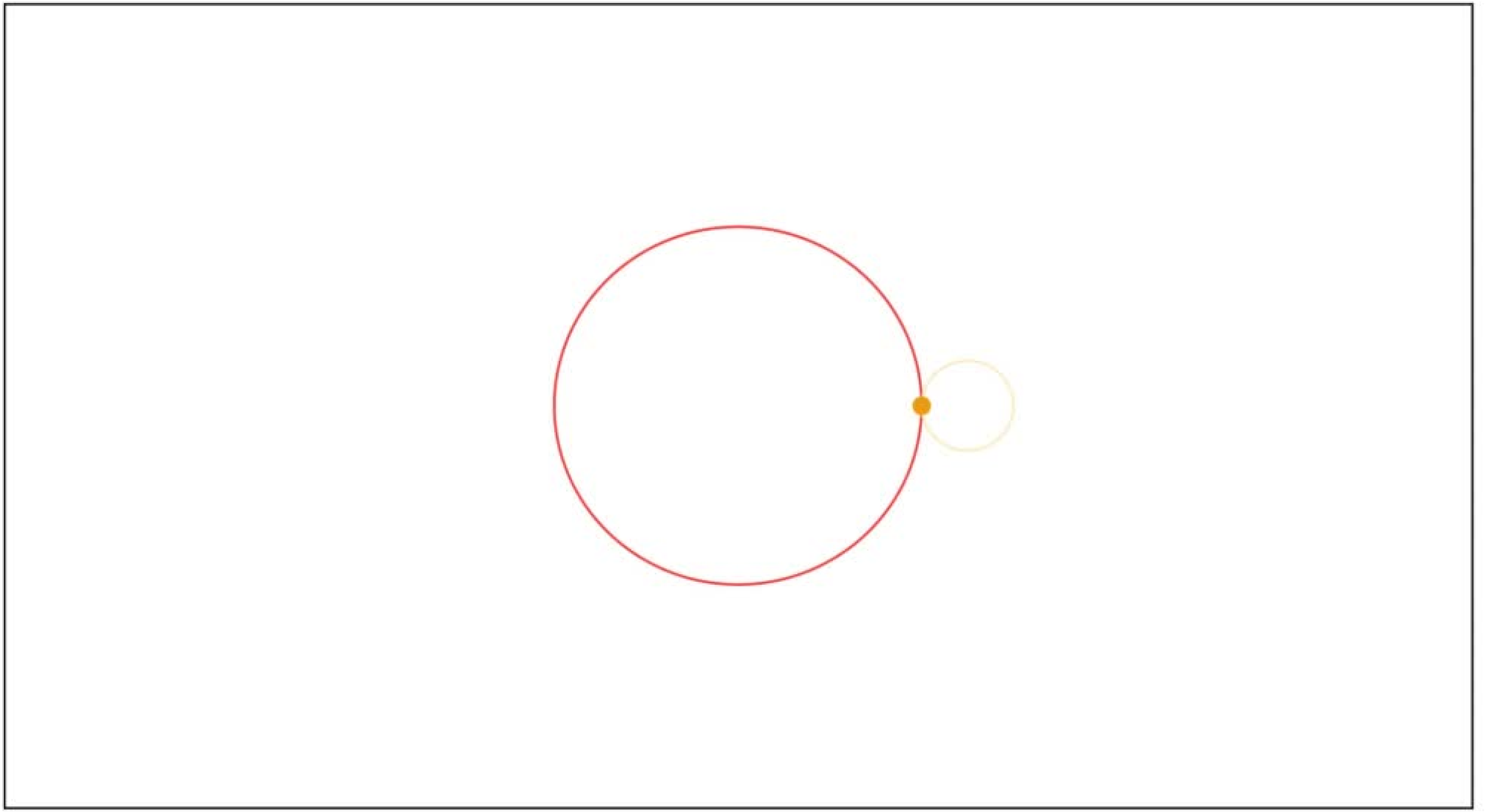
$$k = 2$$



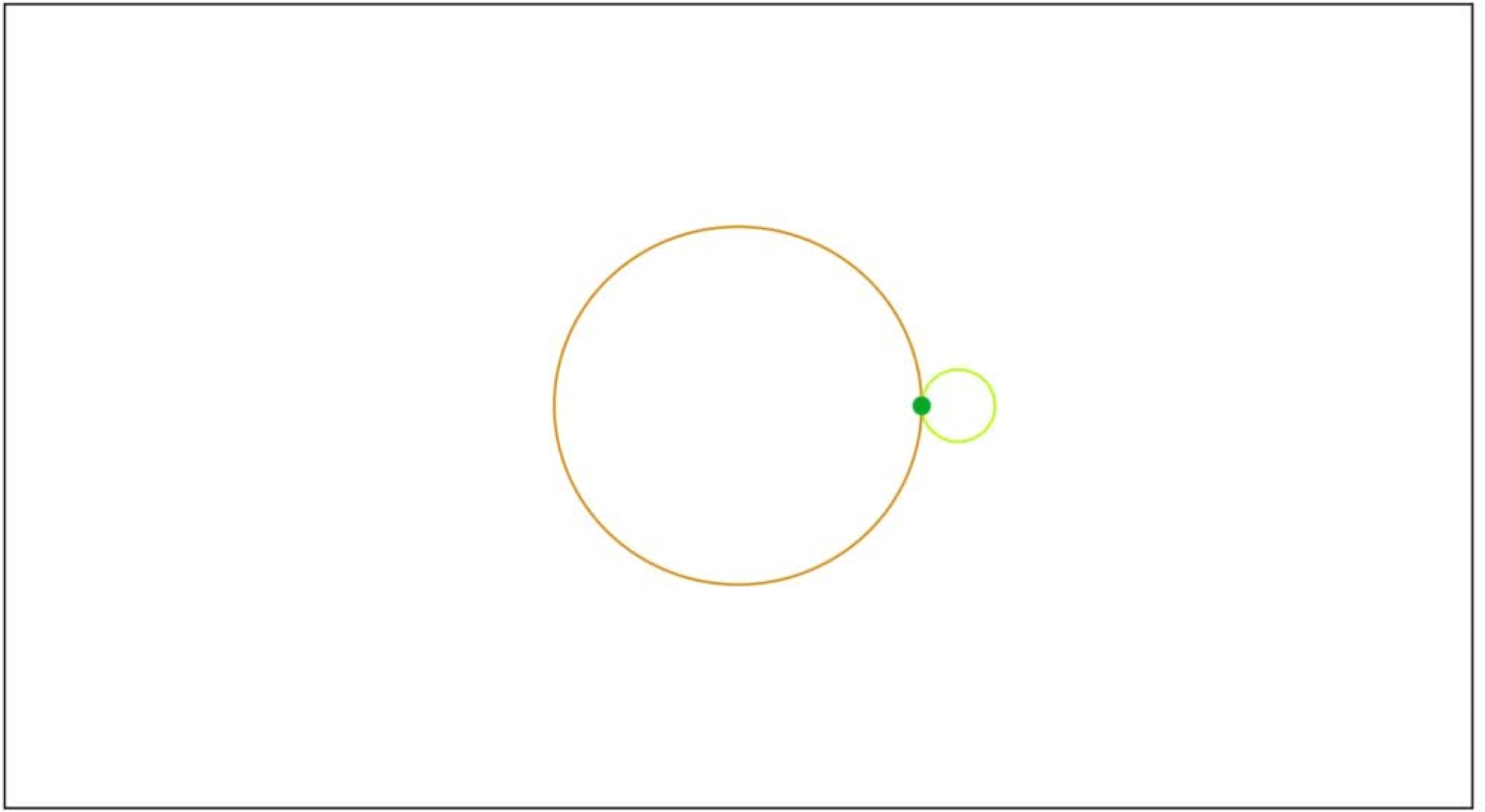
$$k = 3$$



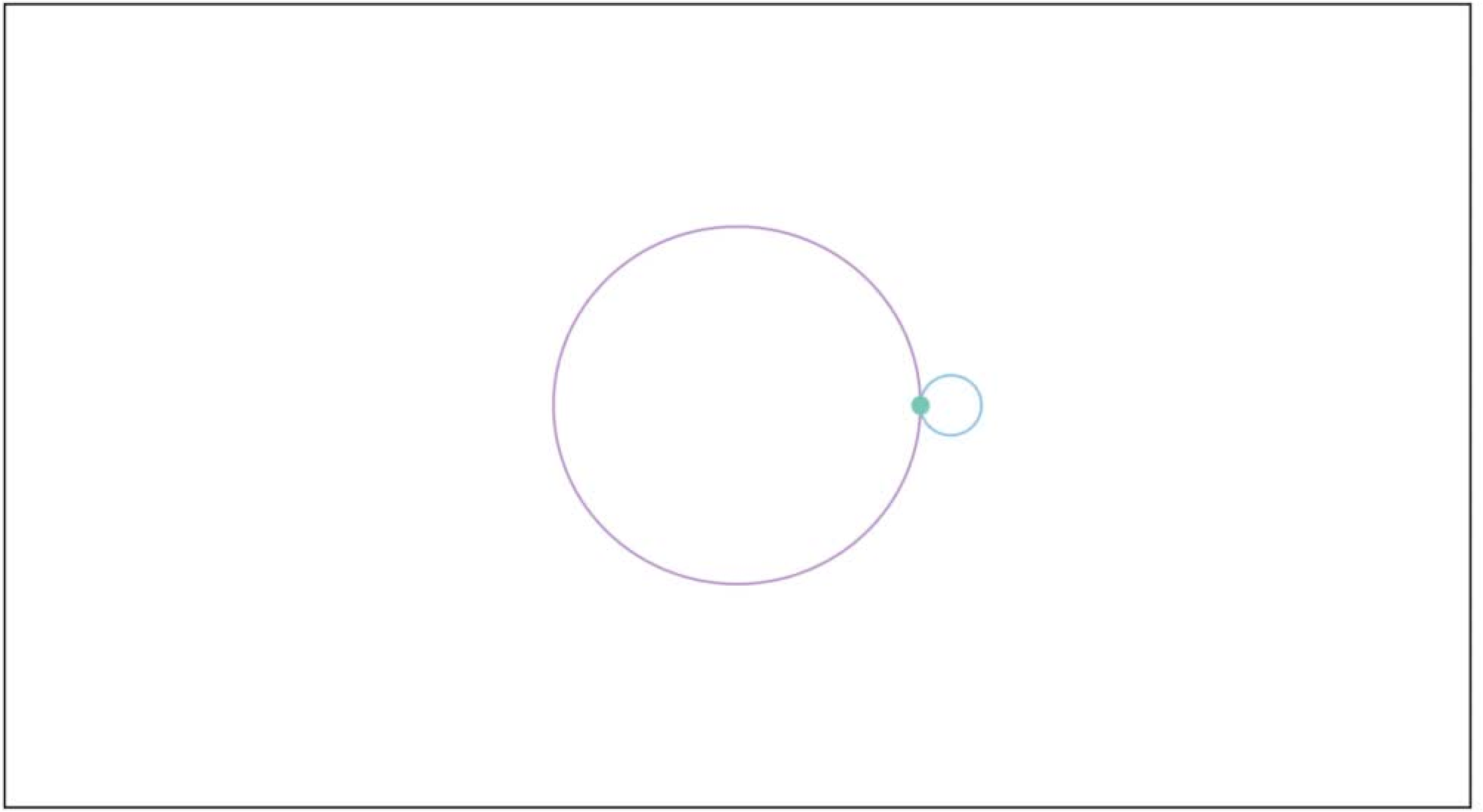
$$k = 4$$



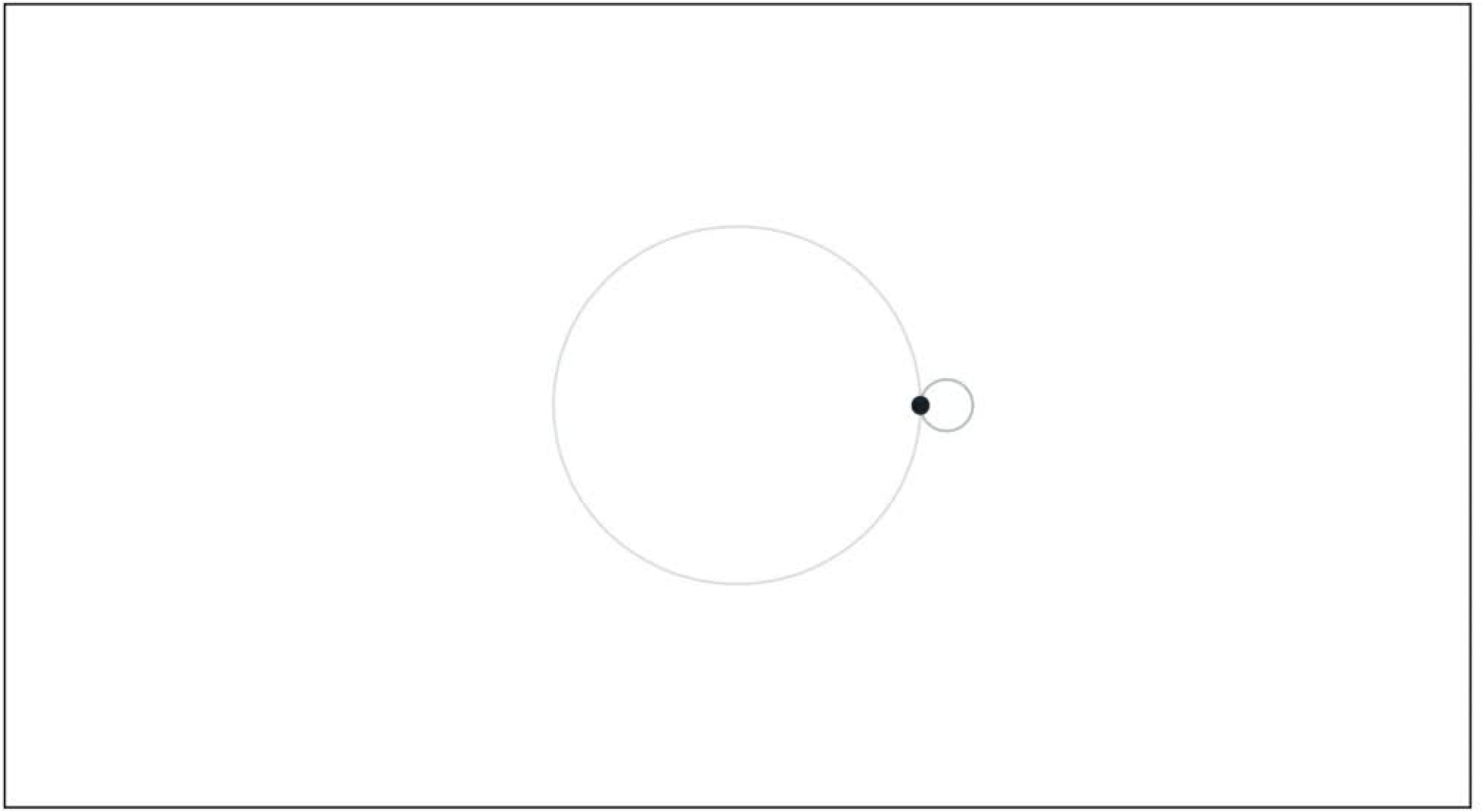
$$k = 5$$



$$k = 6$$



$$k = 7$$



Equation of epicycloid

$$x(\theta) = r(k+1)cos(\theta) - rcos((k+1)\theta)$$

$$y(\theta) = r(k+1)sin(\theta) - rsin((k+1)\theta)$$

$$0 \leq \theta \leq 2\pi$$

$$k = \frac{R}{r}$$


Thank You
for
Watching

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