

# Hypocykloida – predĺžená hypocykloida $c > r > 0, R > 0$

$$x = (R-r) \cos \frac{rt}{R} + c \cos \frac{(R-r)t}{R}, y = (R-r) \sin \frac{rt}{R} - c \sin \frac{(R-r)t}{R}, t \in \mathbb{R}.$$

$$x = (R-r) \cos \varphi + c \cos \frac{(R-r)\varphi}{r}, y = (R-r) \sin \varphi - c \sin \frac{(R-r)\varphi}{r}, \varphi \in \mathbb{R}.$$

$$\begin{aligned}x &= (\pi-1)r \cos \frac{t}{\pi} + 4r \cos \frac{(\pi-1)t}{\pi} \\y &= (\pi-1)r \sin \frac{t}{\pi} - 4r \sin \frac{(\pi-1)t}{\pi} \\t &\in \langle 0; 19.4779\pi \rangle\end{aligned}$$

$$R = \pi r, c = 4r$$

$$\begin{aligned}x &= (\pi-1)r \cos \varphi + 4r \cos (\pi-1)\varphi \\y &= (\pi-1)r \sin \varphi - 4r \sin (\pi-1)\varphi \\ \varphi &\in \langle 0; 6.2\pi \rangle\end{aligned}$$