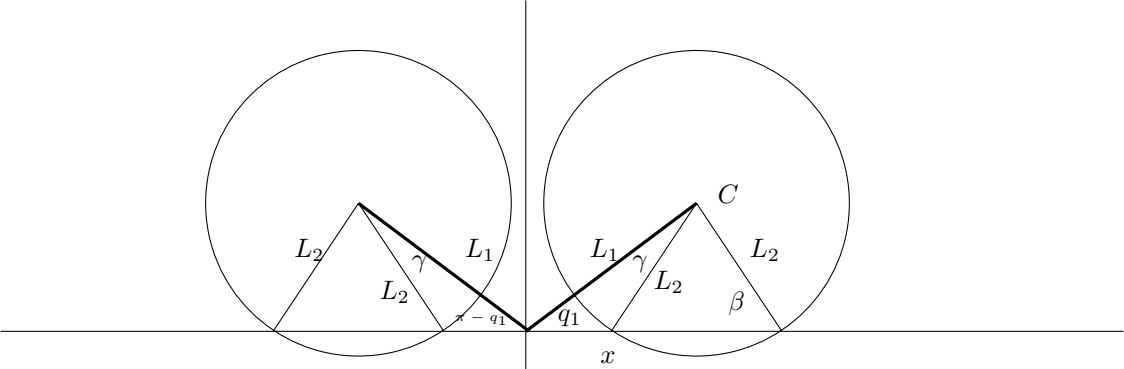

$D = L_2^2 - L_1^2 \sin^2(q_1)$

No intersection if $D < 0$

$x = L_1 \cos(q_1) - \sqrt{(D)}$

$\frac{L_2}{\sin(q_1)} = \frac{L_1}{\sin(\beta)}$

$\frac{x}{\sin\gamma} = \frac{L_2}{\sin(q_1)}$

$q_2 min = -q_1 - \beta$

$q_2 max = \pi + \gamma$