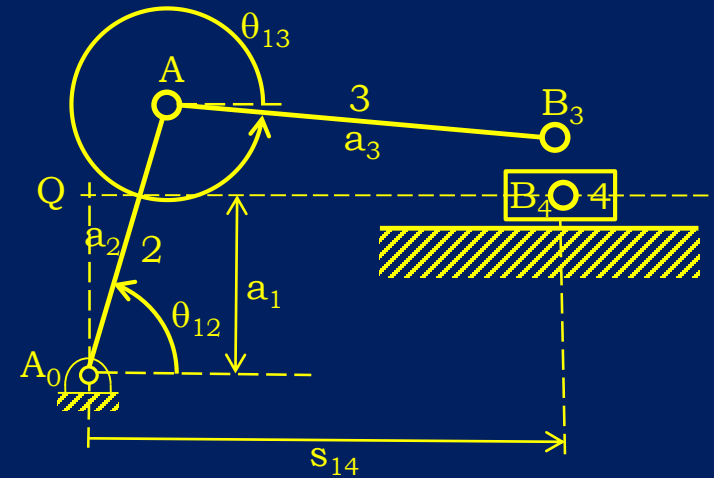# 2. Kinematic Analysis

**Slider-Crank**

$$\overrightarrow{A_0A} + \overrightarrow{AB_3} = \overrightarrow{A_0B_4}$$

This vector equation forces $B_3$ and $B_4$ be a permanently coincident point, the revolute



joint between links 3 and 4, B. This vector equation can be written using complex numbers as:

$$a_2 e^{i\theta_{12}} + a_3 e^{i\theta_{13}} = ia_1 + s_{14}$$

This is a *complex* equation in three unknowns, $\theta_{12}$, $\theta_{13}$ and $s_{14}$. If one of those variables (recall F =1 for a slider-crank) is known the other two can be determined.