Holonomic Constraint ②

$$\left[(r+a)\sin\theta_1 + l - (r+b)\sin\theta_2\right]^2 + \left[(r+a)\cos\theta_1 - (r+b)\cos\theta_2\right]^2 - l^2 = 0$$

* making θ_1 or θ_2 subject of formula yields imaginary numbers. Avoid

* Making a or b subject of formula gives ~~no~~ two roots with large formula. — difficult to work with

* making $(a+r)$ or $(b+r)$ subject of the formula gives a better equation to work with.

Holonomic ② with $\underline{\underline{B = (r+b)}}$ & $A = (r+a)$

↳ $\underline{\underline{\text{subject}}}$

$$\dot{\left(\frac{l \sin \Theta_2 - \#1 + \#3 + \#4}{\#2}\right)} \quad \text{--- ①}$$

$$\dot{\left(\frac{l \sin \Theta_2 + \#1 + \#3 + \#4}{\#2}\right)} \quad \text{--- ②}$$

$\#2 = \dot{\cos} \Theta_2^2 + \dot{\sin} \Theta_2^2 = 1$

$\#3 = A \dot{\cos} \Theta_1 \dot{\cos} \Theta_2$

$\#4 = A \dot{\sin} \Theta_1 \dot{\sin} \Theta_2$

$$\#1 = \text{Sqrt}\Big[\overbrace{l^2 \sin \Theta_2^2}^{\dot{\text{I}}} \overbrace{- A^2 \cos \Theta_1^2 \sin \Theta_2^2}^{\dot{\text{II}}} \overbrace{- A^2 \cos \Theta_2^2 \sin \Theta_1^2}^{\dot{\text{III}}} \overbrace{- 2 A l \cos \Theta_2^2 \sin \Theta_1}^{\dot{\text{IV}}}$$

$$+ \overbrace{2 A^2 \cos \Theta_1 \cos \Theta_2 \sin \Theta_2}^{\dot{\text{V}}} + \overbrace{2 A l \cos \Theta_1 \cos \Theta_2 \sin \Theta_2}^{\dot{\text{VI}}}\Big]$$

$\times \sin \Theta_1$

$\underline{\underline{\text{① } \overset{\&}{\text{or}} \text{ ②}}}$ to be substituted in Θ_2 coordinate $(r+b)$

$(r+b) = $ ① & ②

$b = [$① or ②$] - r$

$\frac{d}{dt}(r) = 0 \quad \therefore \quad \underline{\underline{(r+b)' = B'}} \Rightarrow$