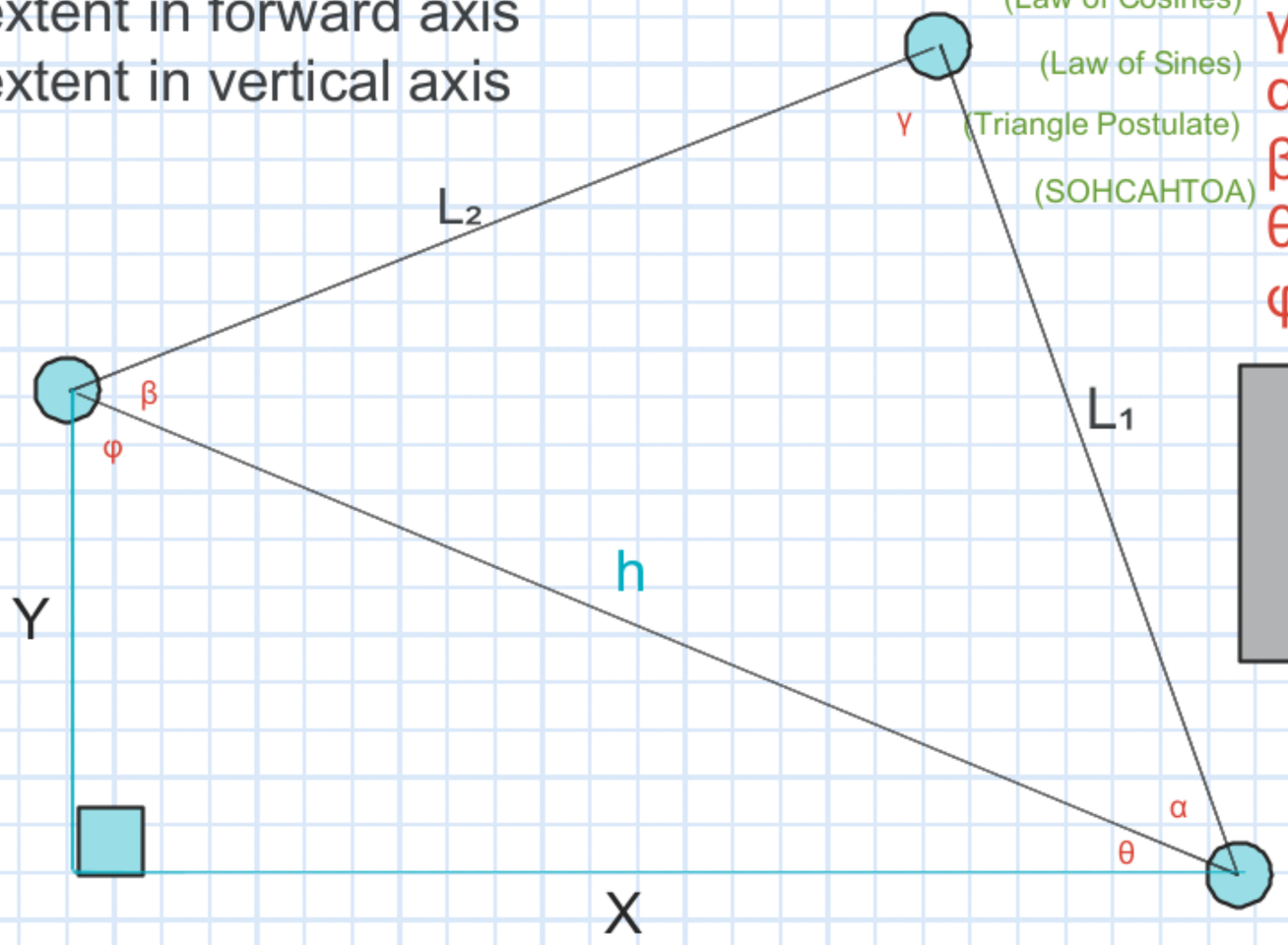
Inputs

L_1: Length of upper arm
L_2: Length of forearm
X: Desired extent in forward axis
Y: Desired extent in vertical axis



Derived Quantities

(Pythagorean Theorem) $h = \sqrt{X^2 + Y^2}$

(Law of Cosines) $\gamma = \arccos((h^2 - L_1^2 - L_2^2) / (-2L_1L_2))$

(Law of Sines) $\alpha = \arcsin((L_2 \sin \gamma) / h)$

γ (Triangle Postulate) $\beta = \pi - \alpha - \gamma$

(SOHCAHTOA) $\theta = \arcsin(Y / h)$

$\varphi = \arcsin(X / h)$

Shoulder angle = α + θ
Elbow angle = γ
Wrist angle = β + φ