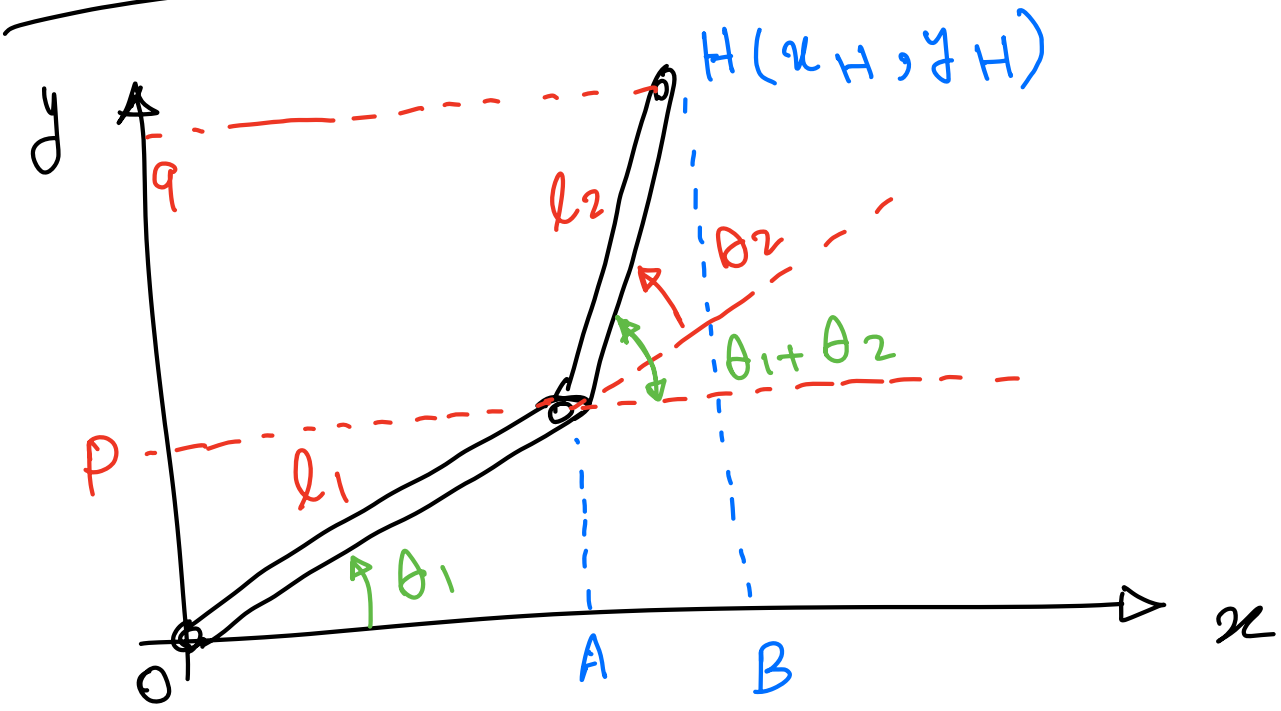
Example

2-link robot



$$y_H = \overline{Op} + \overline{pq}$$

$$x_H = \overline{OA} + \overline{AB}$$

Forward kinematics:

$l_1, l_2, \theta_1, \theta_2$ are given.

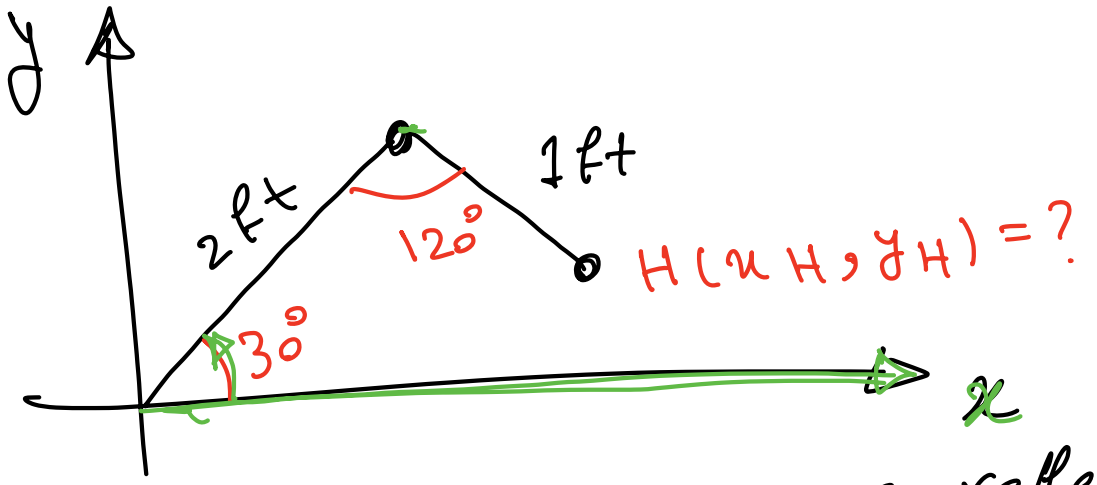
Find x_H, y_H

$$x_H = l_1 \cos\theta_1 + l_2 \cos(\theta_1 + \theta_2)$$

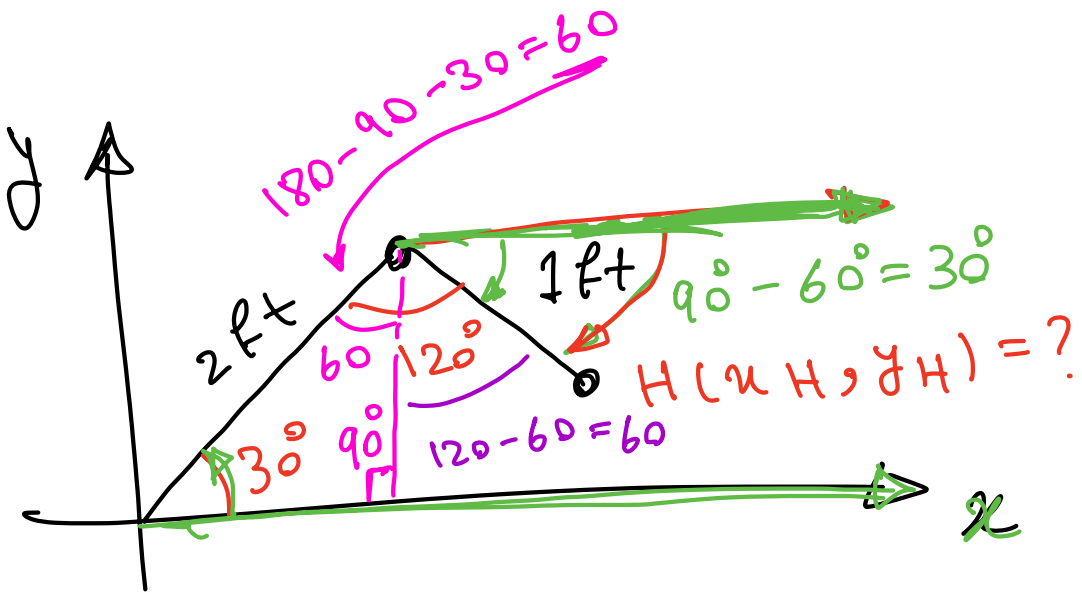
$$y_H = l_1 \sin\theta_1 + l_2 \sin(\theta_1 + \theta_2)$$

Example

Find x_H and y_H.



Important: Define the same reference for all the angles.



$$x_H = 2\cos 30^\circ + 1\cos(-30^\circ) = 2.59$$

$$y_H = 2\sin 30^\circ + 1\sin(-30^\circ) = 0.5$$