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$L_1 = 2\ m$

$L_2 = 1.5\ m$

Max Length $= L_1 + L_2 = 2 + 1.5 = 3.5\ m$

Min Length $= |L_1 - L_2| = |2 - 1.5| = 0.5\ m$

Range $= [0.5, 3.5]\ m$

Targets

1. $(x, y) = (2, 1)$

$r = \sqrt{2^2 + 1^2} = \sqrt{5} = 2.23\ m$ (reachable)

$q_1 = \tan^{-1}\frac{y}{x} - \tan^{-1}\frac{L_2 \sin q_2}{L_1 + L_2 \cos q_2}$ $\quad q_2 = \cos^{-1}\left(\frac{x^2 + y^2 - L_1^2 - L_2^2}{2L_1L_2}\right)$

$q_1 = -0.2161$ rad $\quad q_2 = 1.654$ rad.

2. $(x, y) = (3, 0)$

$r = 3\ m$ (reachable)

$q_1 = -0.5236$ rad $\quad q_2 = 1.047$ rad

3. $(x, y) = (0, 3.4)$

$r = 3.4\ m$ (reachable)

$q_1 = 1.3414$ rad & $q_2 = 0.342$ rad.

4. $(x, y) = (0, -2.5)$

$r = 2.5\ m$ (reachable

$q_1 = -1.097$ rad $\quad q_2 = 1.318$ rad.

5. } Unreachable
6. }