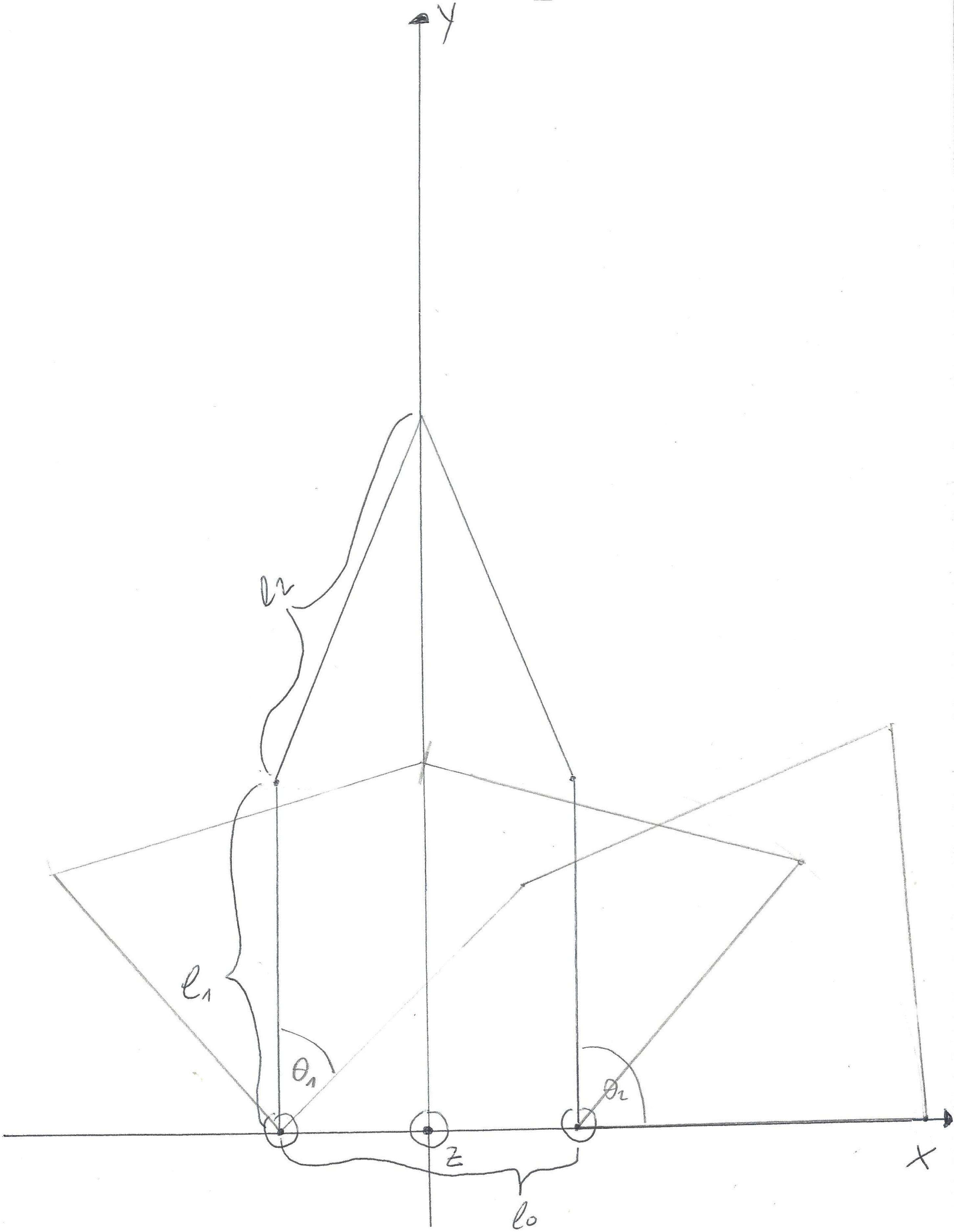
SKETCH 1

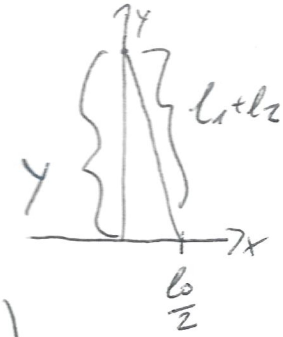


Observation:

- highest reachable point:

$$y = \sqrt{(l_1+l_2)^2 - \frac{l_0^2}{4}}$$

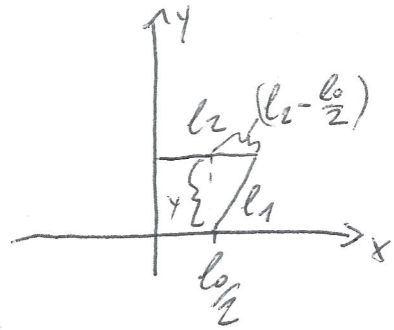
$$(x,y) = \left(0, \sqrt{(l_1+l_2)^2 - \frac{l_0^2}{4}}\right)$$



- lowest reachable point:

$$y = \sqrt{l_1^2 - \left(l_2 - \frac{l_0}{2}\right)^2}$$

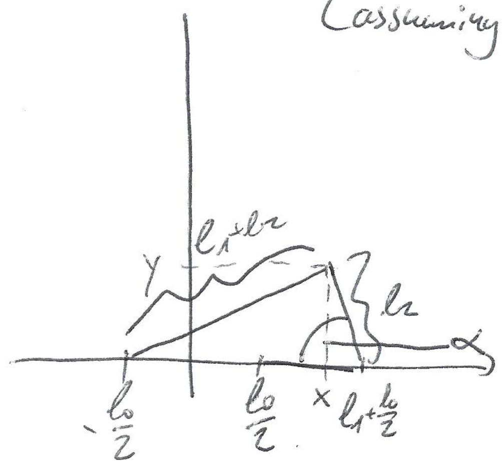
$$(x,y) = \left(0, \sqrt{l_1^2 - \left(l_2 - \frac{l_0}{2}\right)^2}\right)$$



- right most point:

$$\cos\alpha = \frac{l_2^2 + (l_0+l_1)^2 - (l_1+l_2)^2}{-2\cdot(l_0+l_1)\cdot l_2}$$

(assuming that this is still how it looks like)



$$(l_1+l_0) - \left(x + \frac{l_0}{2}\right) = l_2 \cdot \cos\alpha$$

$$\Rightarrow x = l_1 + \frac{l_0}{2} - l_2\cos\alpha$$

$$= l_1 + \frac{l_0}{2} + \frac{l_2^2 + (l_0+l_1)^2 - (l_1+l_2)^2}{2(l_0+l_1)}$$

$$= \frac{3}{2}l_1 + l_0 + \frac{1}{2}\,\frac{l_2^2 - (l_1+l_2)^2}{(l_0+l_1)}$$

$$y = \sqrt{l_2^2 - \left(l_1 + \frac{l_0}{2} - x\right)^2} = \sqrt{l_2^2 - \left(\frac{1}{2}(l_0 - l_1) + \frac{(l_1+l_2)^2 - l_2^2}{2(l_0+l_1)}\right)^2}$$

Naive assessment of the situation:

"we want to achieve a square that means that we want the difference of the highest reachable point & the lowest reachable point to be equal to twice the maximum displacement to the side"

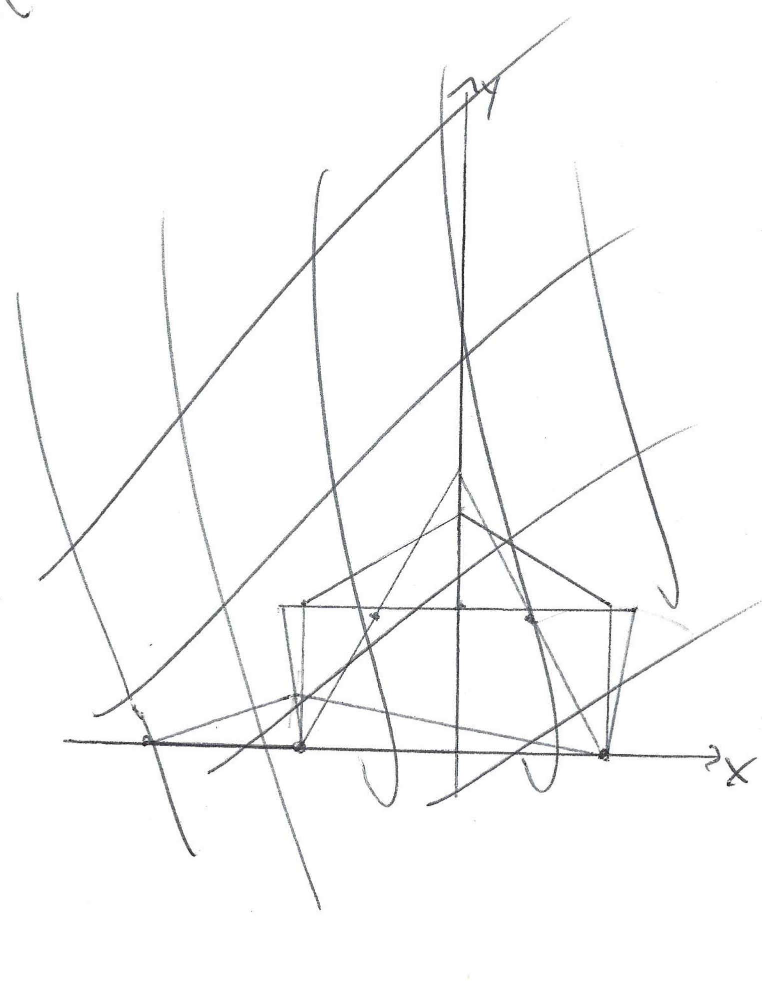
$$\Rightarrow \quad y_{high} - y_{low} \overset{!}{=} 2 \cdot x_{rightmost}$$

$$\Leftrightarrow \quad \sqrt{(l_1+l_2)^2 - \frac{l_0^2}{4}} - \sqrt{l_1^2 - \left(l_2 - \frac{l_0}{2}\right)^2} = 3l_1 + 2l_0 + \frac{l_2^2 - (l_1+l_2)^2}{(l_0+l_1)}$$

no definite solution!

l_0	l_1	l_2
1	1	1.1563
1	1.2	1.15724
1	1.1	1.1386
1	0.9	1.1561

SKETCH 2



l_0	l_1	l_2
1	1	false
1	2	2.344
1	1.5	1.9828
1	2.5	2.669

SKETCH 2