

Formula sheet

Uniform motion:

$$s = \frac{L}{\beta} \theta$$

Parabolic motion:

- 1st parabola

$$s = \frac{2L}{\beta^2} \theta^2$$

- 2nd parabola

$$s = -L + \frac{4L}{\beta} \theta - \frac{2L}{\beta^2} \theta^2$$

Simple harmonic motion:

$$s = \frac{L}{2} \left(1 - \cos \frac{\pi \theta}{\beta} \right)$$

Cycloidal motion:

$$s = L \left(\frac{\theta}{\beta} - \frac{1}{2\pi} \sin \frac{2\pi \theta}{\beta} \right)$$

During rise, replace θ with $\theta - \theta_i$.

During return, replace θ with $\theta_e - \theta$.