

## Vertical Displacement Equation

Vertical Velocity Equation:

$$y = \frac{\sqrt{gkm} \times (1 - e^{-\frac{2x\sqrt{gkm}}{m}})}{(e^{-\frac{2x\sqrt{gkm}}{m}} + 1) \times k}$$

Displacement:

$$h = \int \frac{\sqrt{gkm} \times \left(1 - e^{-\frac{2x\sqrt{gkm}}{m}}\right)}{\left(e^{-\frac{2x\sqrt{gkm}}{m}} + 1\right) \times k} d(x)$$

$$h = \frac{m (\ln(e^{-\frac{2x\sqrt{gkm}}{m}} + 1)) + x\sqrt{gkm}}{k} - 81,7709753166429$$

