

excel - $m = 4.7384$

$$4.7384 = \frac{4\pi^2}{g}$$

$$g = 8.3316$$

$$\% \text{ error} = 14.968\%$$

wind, pin instability, and altitude factors could have been the reason for percent error. crude experiment

$$I_{PP} = \frac{1}{12} ML^2 + Md^2$$

$$T = 2\pi \sqrt{\frac{I_{PP}}{mgd}}$$

$$T^2 = 4\pi^2 \cdot \frac{I_{PP}}{mgd}$$

$$T = 2\pi \sqrt{\frac{\frac{1}{12}L^2 + d^2}{gd}}$$

$$T = 2\pi \sqrt{\frac{I_{cm} + Md^2}{mgd}}$$

$$\left(\frac{T}{2\pi}\right)^2 = \frac{L^2 + d^2}{12gd}$$

$$T = 2\pi \sqrt{\frac{\frac{1}{12}L^2 + d^2}{gd}}$$

$$T^2 = 4\pi^2 \cdot \left[\frac{L^2 + d^2}{12gd} \right]$$

$$T^2 = \frac{4\pi^2}{g} \left[\frac{\frac{1}{12}L^2 + d^2}{d} \right]$$

$$T^2 = \frac{\pi^2 + 12\pi^2 d^2}{3gd}$$

.75m

$$(1.538)^2 = \frac{4\pi^2}{g} \left[\frac{\frac{1}{12} + .75^2}{.75} \right]$$

$$y = 2.3654$$

$$\frac{4.055}{4\pi^2} = \frac{1}{g}$$

$$x = .583$$

$$(.103)^{-1} = g$$

$$9.7356 = g$$

.15m

$$(1.724)^2 = \frac{4\pi^2}{g} \left[\frac{\frac{1}{12} + .15^2}{.15} \right]$$

$$y = 2.9722$$

$$4.2125 = \frac{4\pi^2}{g}$$

$$x = .7056$$

$$.1067 = \frac{1}{g}$$

$$g = 9.3717$$

.5m

$$(1.633)^2 = \frac{4\pi^2}{g} \left[\frac{\frac{1}{12} + .5^2}{.5} \right]$$

$$y = 2.667$$

$$4. = \frac{4\pi^2}{g}$$

$$x = .667$$

$$.1013 = \frac{1}{g}$$

$$g = 9.8695$$