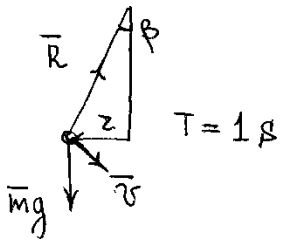
Answer on Question #79843, Physics / Mechanics | Relativity

Question:

A weight concentrated at the end of a cord forms a conical pendulum for which the period is 1 sec. Determine the velocity of the weight if the chord rotates at 30 degree withe the vertical.

Solution:



As far as $R\cos\beta = mg$, $R\sin\beta = m\omega^2 r$, then $r = \frac{g\tan\beta}{\omega^2} = \frac{gT^2\tan\beta}{4\pi^2}$. Meantime $v = \frac{2\pi r}{T} = \frac{gT\tan\beta}{2\pi}$, i.e. $v = \frac{10\times 1\times 0.58}{6.28} = 0.92$ (m/s).

The answer:

$v = \frac{gT\tan\beta}{2\pi} = 0.92$ m/s.