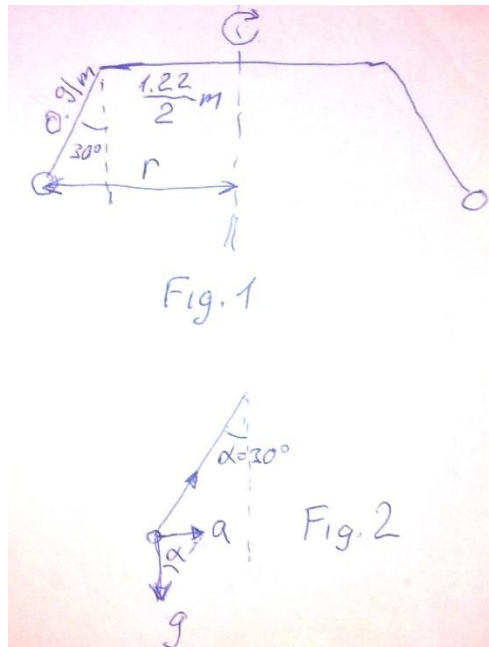


Answer on Question #79844, Physics - Mechanics | Relativity

A rod 1.22 meter long rotates in a horizontal plane about a vertical axis through its center. At each end of the rod is fastened a cord 0.91 meters long. Each chord supports a weight W . Compute the speed of rotation in rev/min when the weight is inclined 30 degrees with the vertical.



As could be seen from the Fig.1, $r = 1.22/2 + 0.91 \cdot \sin 30^\circ = 0.61 + 0.455 = 1.065$ m.

As could be seen from the Fig.2, $a = g \cdot \tan 30^\circ = 9.81 \cdot \sqrt{1/3} = 5.66$ m/s².

From $a = u^2/r$, $u = \sqrt{a \cdot r} = 2.45$ m/s \rightarrow 147.4 m/min.

So, rotation is $n = u / (2 \cdot \pi \cdot r) = 22$ rev/min.

Answer provided by <https://www.AssignmentExpert.com>