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$r = 0.9\,m$ $\quad v_i = 0$ $\quad \Delta t = 1.0\,s.$ $\quad v_f = ?$

1 complete revolution = 2π radians, or a distance of $2\pi r$.

what is v_f ?

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Wrong guess: $v = \frac{2\pi r}{\Delta t} = 5.65\,m/s.$

why is it wrong? It assumes constant velocity.

Recall

$$\Delta x = v_i t + \frac{1}{2} a t^2$$

($v_i t$: this is actually zero.) ($\frac{1}{2} a t^2$: oops - ignored this?)

In angular terms

$$\Delta \theta = \omega_i t + \frac{1}{2} \alpha t^2$$

$\Delta \theta = 2\pi = 1$ revolution

$\Delta t = 1.0\,s$

$$\alpha = \frac{2\Delta\theta}{t^2} = \frac{2(2\pi)}{(1.0\,s)^2} = 4\pi\,rad/s^2$$

Then

$$\omega_f = \omega_i + \alpha \Delta t$$

$\omega_f = \omega_i + \alpha \Delta t$. Plug in $\alpha = \frac{2\Delta\theta}{t^2}$

$$\omega_f = \underbrace{\omega_i}_{0} + \left(\frac{2\Delta\theta}{t^2}\right) t$$

$$\omega_f = 2\frac{\Delta\theta}{t} = \frac{2(2\pi)}{1.0s} = \frac{4\pi\, rad}{s}$$

Then $v_f = \omega_f r = \frac{2(2\pi r)}{\Delta t} = \boxed{11.3 m/s}$

Our wrong guess above was missing that factor of 2.