Answer on Question #53484-Physics-Mechanics-Kinematics-Dynamics

w= theta/time

w/t = theta/time squared

dw/dt= dtheta/d time squared

a=dtheta/d time squared

where w is angular velocity and a is angular acceleration.

But this is wrong! a= d SQUARED theta/d time squared?

Solution

Angular velocity is

$$\omega = \frac{d\theta}{dt} \neq \frac{\theta}{t}.$$

Angular acceleration is

$$\alpha = \frac{d\omega}{dt} = \frac{d}{dt}\left(\frac{d\theta}{dt}\right) = \frac{d^2\theta}{dt^2}.$$

In addition we never use unpaired d in the formulas for derivatives. We cannot use formulas such as

$$\alpha = \left(\frac{d\theta}{dt^2}\right).$$

If t^2 is our variable we can write

$$\alpha = \left(\frac{d\theta}{d(t^2)}\right)$$

when we use first derivative of θ by t^2.