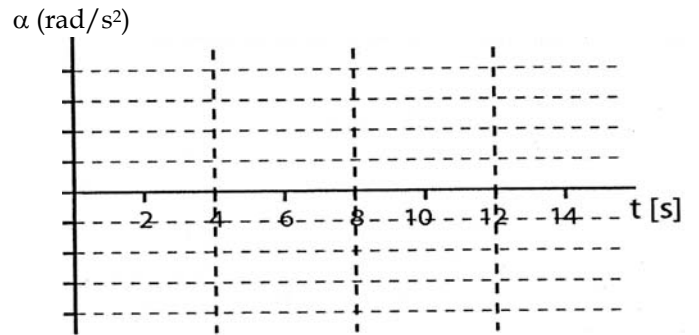
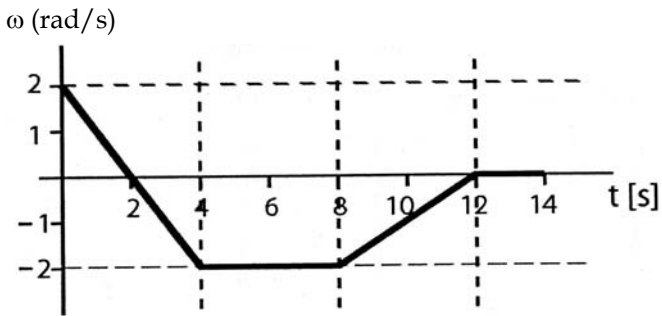
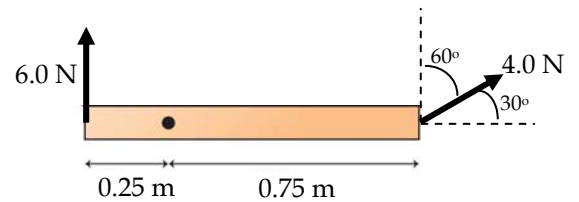


1) Consider the following ω vs. t graph for an object. On the axes provided, plot the α vs. t graph corresponding to the ω vs. t graph. Include appropriate numerical scales on the vertical axis.



2) What is the net torque on the bar shown in the figure about the axis indicated by the dot? The figure is a bird's eye view and the only forces exerting torque are shown.



3) A wheel has a moment of inertia $0.002 \text{ kg}\cdot\text{m}^2$. The net torque applied to the object is $0.006 \text{ N}\cdot\text{m}$. Determine the angular acceleration of the wheel.

4) A block of mass $2m = 0.40$ kg is attached by a lightweight string to a solid cylindrical pulley with mass $m = 0.20$ kg, radius $r = 0.05$ m, and moment of inertia $I = \frac{1}{2}mr^2 = 0.00025$ kg•m². The block is released from rest and falls, and the string unwinds from the pulley, without slipping, so that the pulley rotates. Neglect any friction between the pulley and its axle.

a) Draw and label force diagrams useful for this situation.

b) Use your diagrams and Newton's second laws $\vec{F}_{net} = m\vec{a}$ and $\vec{\tau}_{net} = I\vec{\alpha}$ to write down equations useful for this situation.

c) Determine the acceleration of the block.

