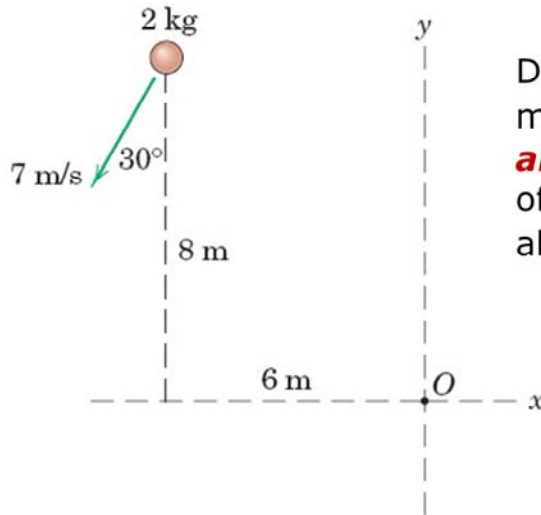


Question of the Day



Determine the magnitude H_O of the **angular momentum** of the **2-kg** sphere about **point O**.

$$\mathbf{H}_O = \mathbf{r} \times m\mathbf{v}$$

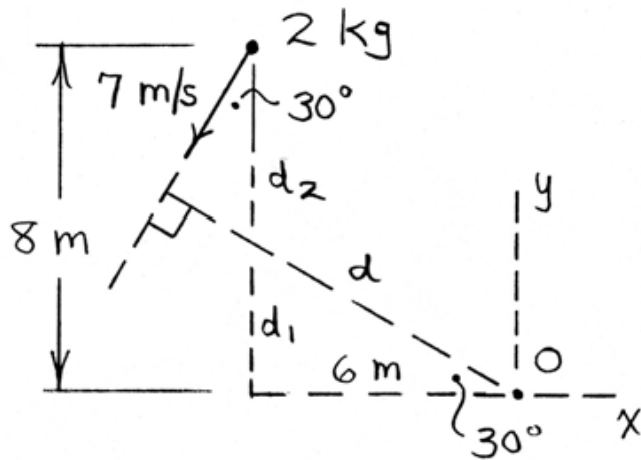
ME 231: Dynamics

$$3/227 \quad (a) \quad \underline{H}_O = \underline{r} \times m\underline{v}$$

$$\begin{aligned} \underline{H}_O &= (-6\underline{i} + 8\underline{j}) \times 2(7)(-\sin 30^\circ \underline{i} - \cos 30^\circ \underline{j}) \\ &= 128.7 \underline{k} \text{ kg}\cdot\text{m}^2/\text{s} \end{aligned}$$

$$\text{So } \underline{H}_O = 128.7 \text{ kg}\cdot\text{m}^2/\text{s}$$

$$\begin{aligned} d_1 &= 6 \tan 30^\circ \\ &= 3.46 \text{ m} \\ d_2 &= 8 - d_1 \\ &= 4.54 \text{ m} \end{aligned}$$



$$d = \frac{6}{\cos 30^\circ} + 4.54 \sin 30^\circ = 9.20 \text{ m}$$

$$\curvearrowright H_O = mvd = 2(7)(9.20) = \underline{128.7 \text{ kg}\cdot\text{m}^2/\text{s}}$$