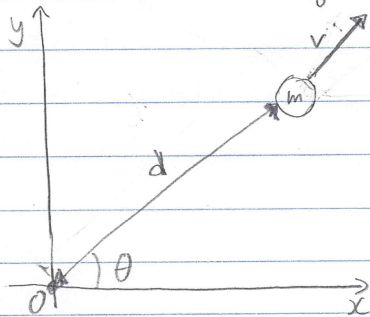


20-P-MOM-DY-17

A $m = 5 \text{ kg}$ particle has the velocity $\mathbf{v} = 2\hat{i} + 4\hat{j} \text{ m/s}$.
If the particle is at $d = 5 \text{ m}$ at $\theta = 30^\circ$ from the point O ,
determine the angular momentum of the particle about O .



Solution: $\mathbf{v} = 2\hat{i} + 4\hat{j} \text{ m/s}$

$$\mathbf{d} = d \cos \theta \hat{i} + d \sin \theta \hat{j} \text{ m} = 4.33\hat{i} + 2.5\hat{j}$$

$$H_O = \mathbf{r} \times m\mathbf{v} = m \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 4.33 & 2.5 & 0 \\ 2 & 4 & 0 \end{vmatrix} = 5(17.32 - 5) = 61.6 \hat{k} \text{ kg} \cdot \text{m}^2/\text{s}$$