

Name _____ Section _____ Date _____

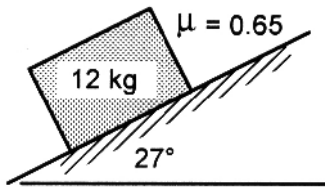
Dynamics - Skill Inventory

Work the following problems without the use of notes or references.

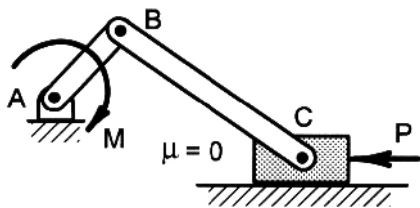
Given the vectors $\bar{\mathbf{v}}_A = 3 \bar{\mathbf{i}} - 2 \bar{\mathbf{j}} + 6 \bar{\mathbf{k}}$ and $\bar{\mathbf{v}}_B = 5 \bar{\mathbf{i}} - 4 \bar{\mathbf{j}} - 2 \bar{\mathbf{k}}$

1. What is the magnitude of $\bar{\mathbf{v}}_A$? _____
2. Write a unit vector parallel to $\bar{\mathbf{v}}_A$ $\hat{\mathbf{e}}_A =$ _____
3. $\bar{\mathbf{v}}_A \cdot \bar{\mathbf{v}}_B =$ _____
4. $\bar{\mathbf{v}}_A \times \bar{\mathbf{v}}_B =$ _____
5. $(\bar{\mathbf{v}}_B \times \bar{\mathbf{v}}_B) \cdot \bar{\mathbf{v}}_A =$ _____

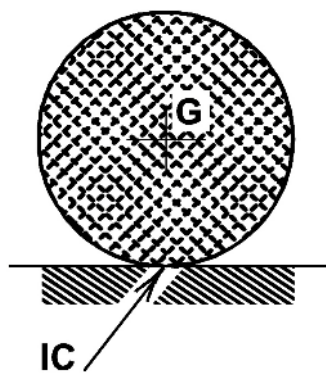
6. Draw the free body diagram for the block. Is the block in equilibrium?



7. Draw the free body diagrams for each part of the linkage.



The wheel shown is a solid disk with a mass of 20 kilograms and a radius of 0.4 meters.



8. Determine the moment of inertia of the wheel about the mass center **G**.

9. Determine the moment of inertia of the wheel about the point labeled **IC**.