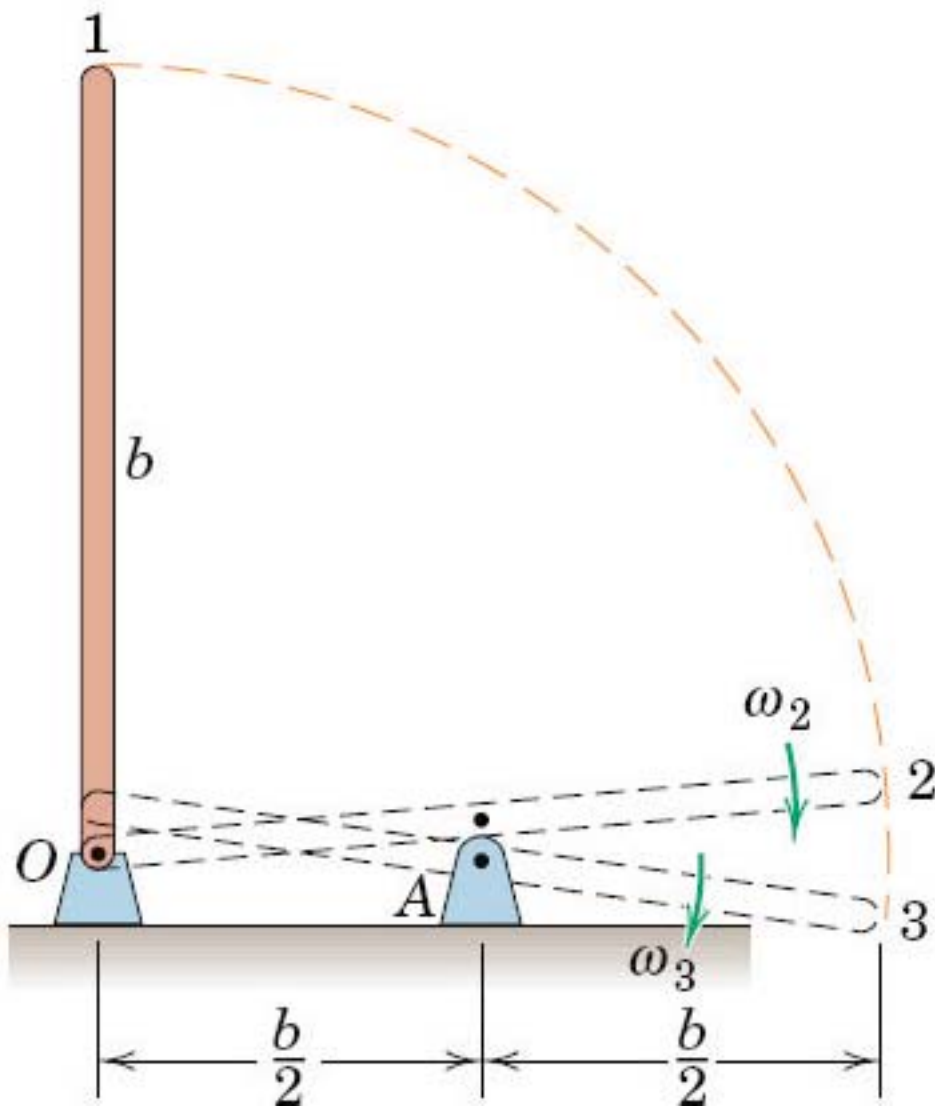


Impulse-Momentum for Rigid Bodies II
Lecture 33

ME 231: Dynamics

Question of the Day



A slender bar of **mass** m and **length** b is released from rest and pivots at O until the bar strikes A and then pivots at A . The **angular velocity** $\omega_2 = (3g/b)^{1/2}$ just before it engages the pivot at A .

Determine the **angular velocity** ω_3 of the bar just after it engages the pivot at A .

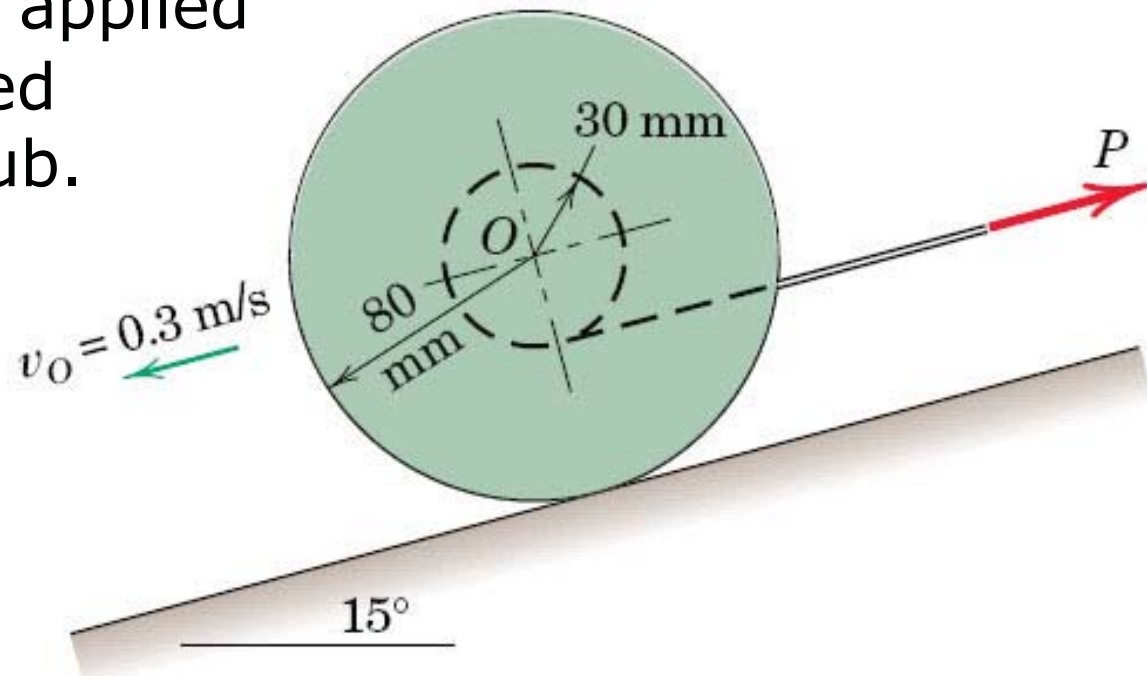
Outline for Today

- Question of the day
- Impulse-momentum for rigid bodies: exercises
- Answer your questions!

Impulse-Momentum for Rigid Bodies: Exercise 1

The **2-kg** wheel, with **radius of gyration** about **O** of **60 mm**, rolls without slipping down the incline with a **velocity $v_0 = 0.3 \text{ m/s}$** when a **force $P = 10 \text{ N}$** is applied to the cord wrapped around its inner hub.

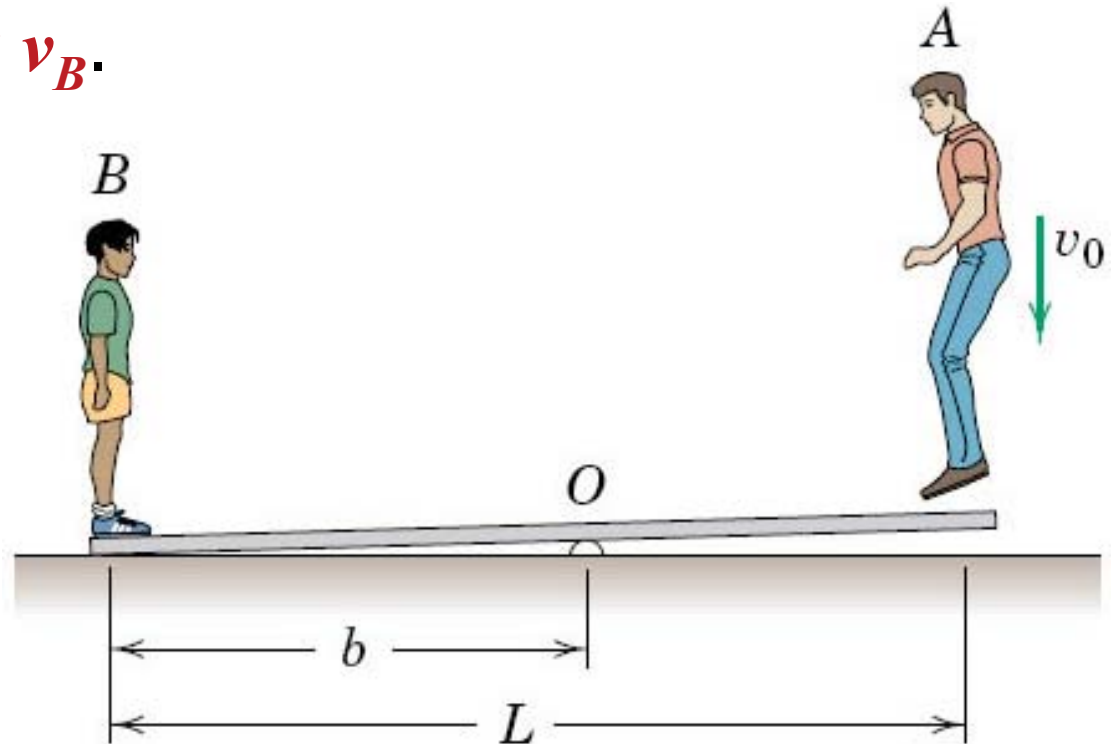
Determine the **velocity v** of the **center O** when **P** has been applied for **5 s**.



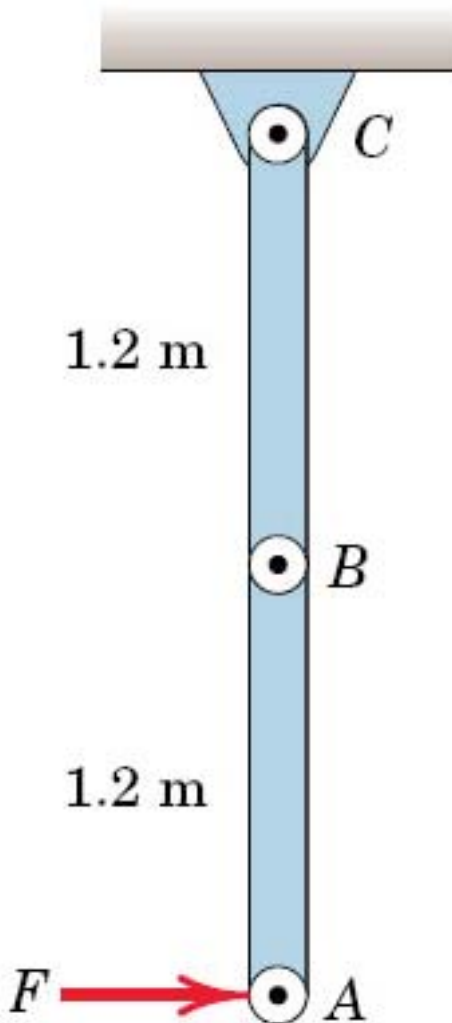
Impulse-Momentum for Rigid Bodies: Exercise 2

The man A of *mass* m_A drops with *velocity* v_0 onto the end of a light beam. The boy B is sent up with a *velocity* v_B .

Determine b in terms of L to maximize the v_B for a given ratio $n = m_B/m_A$.



Impulse-Momentum for Rigid Bodies: Exercise 3



Two slender bars, each with **mass** of **4 kg**, are at rest and hinged at **B** and **C** . An **impulse** of **14 N·s** is applied to the **end A** for **0.1 s**.

Determine the **angular velocity ω_2** of the **upper bar** immediately after the **impulse**.

Outline for Today

- Question of the day
- Impulse-momentum for rigid bodies:
exercises
- Answer your questions!

For Next Time...

- Continue Homework #11 due on ***Wednesday (11/14)***
- Review Chapters 5 & 8