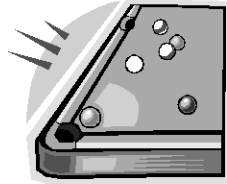


Chapter 15A

Impulse and Momentum



Miami University

1

Linear Impulse & Momentum

- Use 2 standard equations
- $F = ma$ and $a = v/t$ (average)
- Combine and rearrange: $F = mv/t$ which becomes: $F \cdot t = m \cdot v$
- Impulse ($F \times t$) = Momentum

2

Units

- Both impulse & momentum use either N-seconds or Lb-sec
- Remember Lb = Force

3

Change of conditions

- If initial or ending velocity does not equal zero, change in time and change in velocity.
- $\Delta \text{Impulse} = \Delta \text{Momentum}$
- $F \times \Delta t = m \times \Delta v$

4

Angular Impulse & Momentum

- Use the Angular equivalent variables
- Torque = $I_c \alpha$ and $\alpha = \omega/t$
- Combine and rearrange:
- $T \times t = I_c \times \omega$

5

Torque Production

- Note: This torque is produced by a force exerted at a radius, r .
- Friction force must be accounted for in examples such as cylinders rolling down hills (See Example 15-5)

6

Homework

- Problems 15 – 2, 4, & 6
- Problems 15 – 16, 18 & 20
- Will discuss next week – these will not be collected.
- Read Section 15 - 3

7