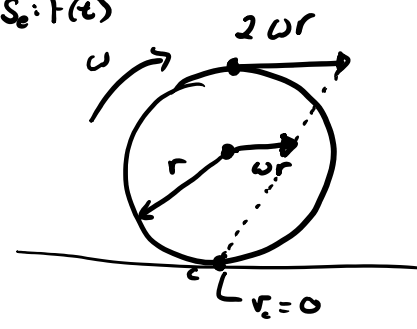
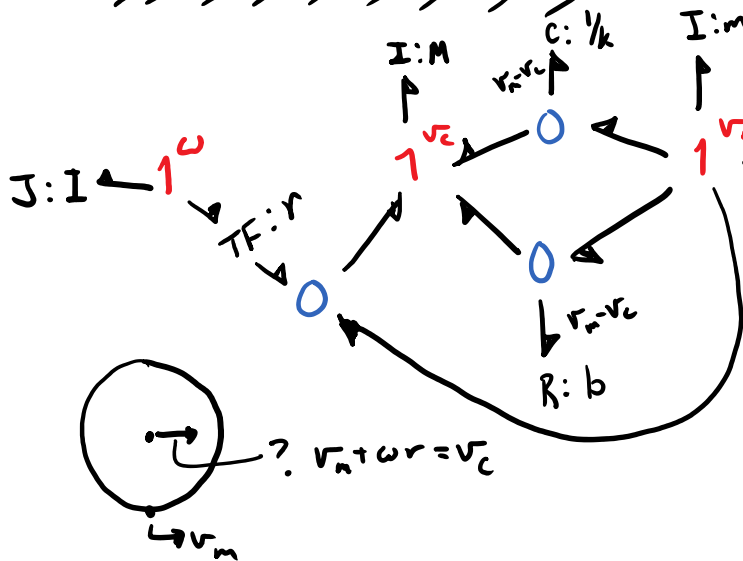
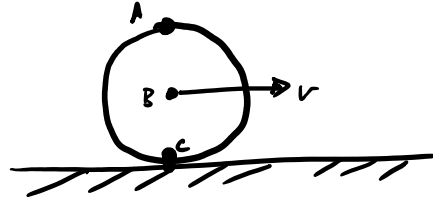
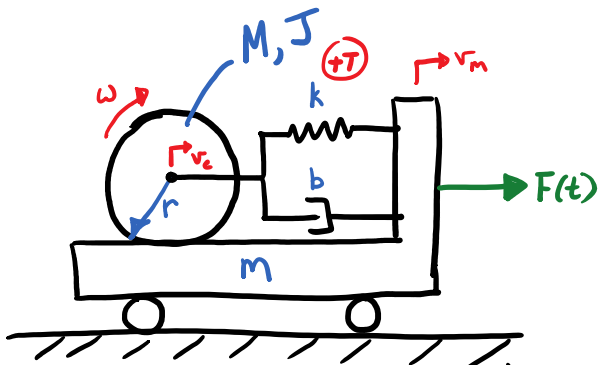


- Lab 2: Due Friday
- Lab 3: introduced Friday
- HW 5: due Sunday
- Midterm, Tuesday Feb 11
  - 80 minutes
  - Chapters 1-4.2.2
  - HW 1-5
  - Lab 1 and 2
  - Lecture materials up through Feb 4
  - No electronic devices
  - Only have writing implement, water at desk
  - Assigned seating chart
  - You may have 2 pages front/back cheat sheets.  
Contents must be written or typed by yourself.
  - Use bathroom before!

# Example: Disc rolling (without slip) on a moving cart

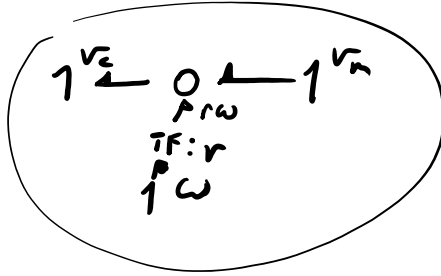
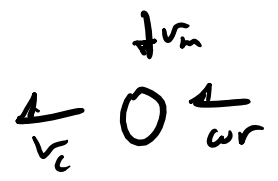


Sum velocities: zero  
June

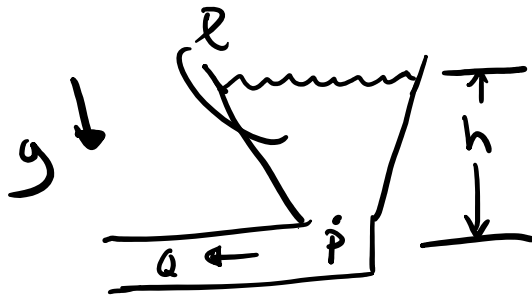
$$v_c = v_m + \omega r$$

Kinematic relationship

$$v_c - v_m - \omega r = 0$$

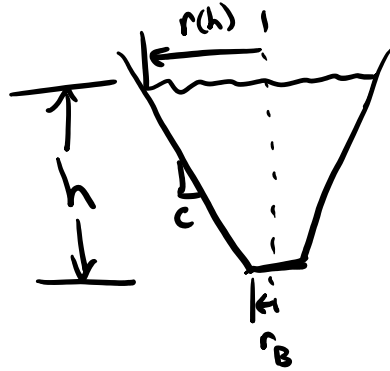


3-3



$\rightarrow c$   
 $P$  pressure  
 $V$  volume

$$P = \rho g h$$



$$V = \int A(h) dh$$

$$r(h) = r_B + ch$$

$$A(h) = \pi r(h)^2 = \pi (r_B + ch)^2$$

$$V = \int \pi (r_B + ch)^2 dh = \pi \int (r_B^2 + c^2 h^2 + 2r_B ch) dh$$

$$V = \pi r_B^2 h + \pi c^2 \frac{h^3}{3} + \pi r_B ch^2$$

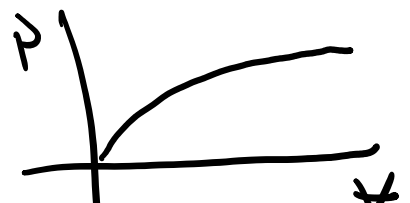
$$V = ah^3 + bh^2 + ch$$

$$h = f(V)$$

$$P = \rho g f(V)$$

if  $r_B = 0$   $V = \frac{\pi c^2}{3} h^3 \Rightarrow h = \sqrt[3]{\frac{3}{\pi c^2} V}$

$$P = \rho g \sqrt[3]{\frac{3}{\pi c^2} V}$$



$$I = C \cup \sqrt{\pi r^2} v$$

$$eC = q$$

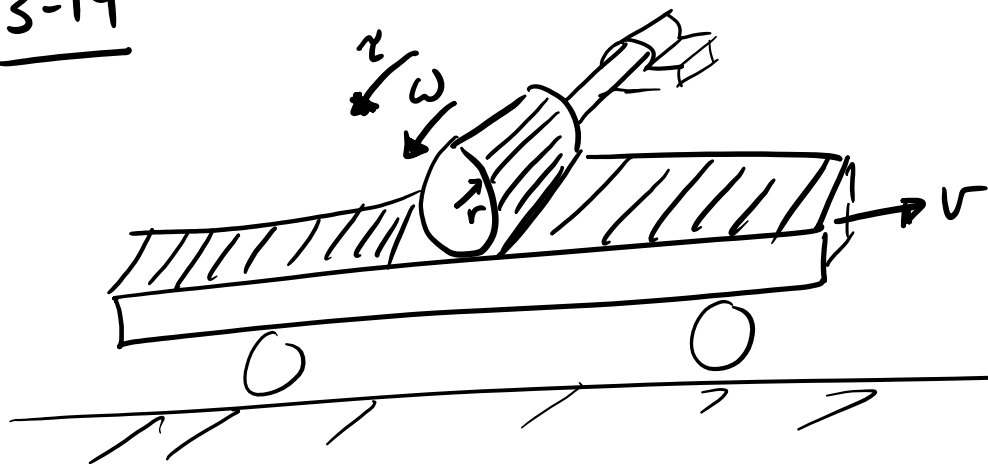
$$C: \frac{A}{\rho g}$$

straight cylinder

$$P = \frac{\rho g}{A} v$$



3-14



linear relationship  
two velocities

$$\omega r = v$$

$$z = rF$$

$$r\omega = v$$

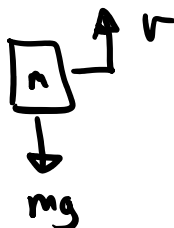
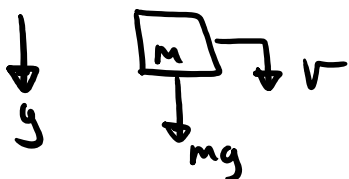
$$\frac{z}{\omega} = \frac{1}{r} F = \frac{F}{v}$$

$$v_i : S_f \frac{F_i}{v_i} \quad \uparrow \quad \frac{v = v_i}{F} \quad v = v_i$$

$$F = F_i$$

$$v_i : S_f \frac{F_i}{v_i} \quad \uparrow \quad \frac{v = v_i}{F} \quad v = v_i$$

$$F = -F_i$$



C

