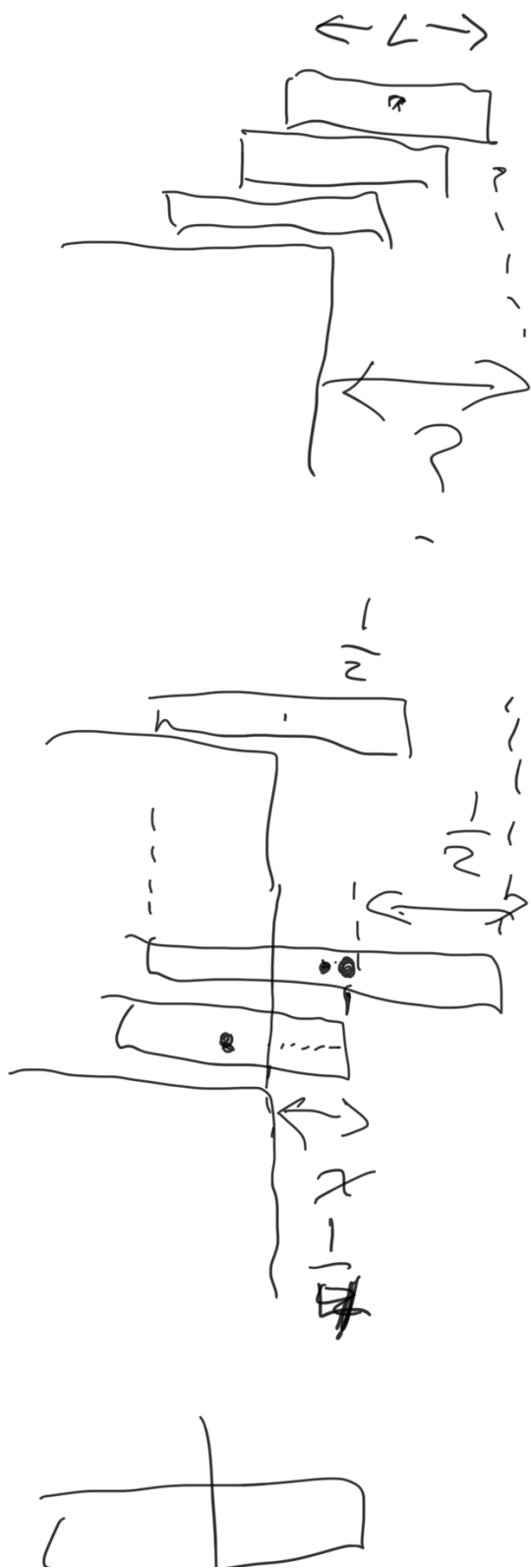


block stack



$$\frac{1 \cdot x + \frac{1}{2} \left( x - \frac{1}{2} \right)}{2} = \frac{2x - \frac{1}{2}}{2} = x - \frac{1}{4}$$



$$1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} \dots$$

$$\int \frac{1}{x} dx \approx \ln(x)$$

Ball Drop



K & K 3.11  
 $\square dm \rightarrow u$



$$p_i = \underline{Mv} + \underline{dm}$$

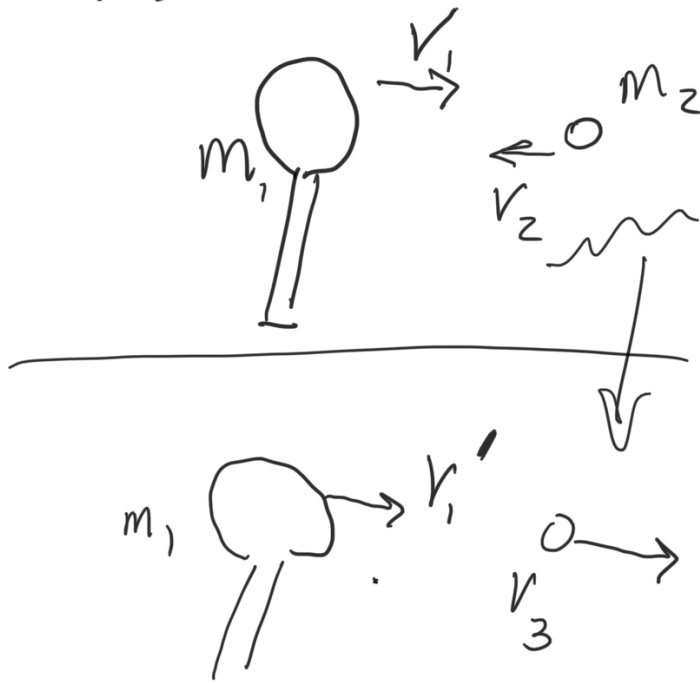
$$\underline{(M + \underline{dm})(\underline{v} + \underline{dv})}$$

$$\cancel{M}V + u \frac{dm}{dt} = \cancel{M}V + M \frac{dv}{dt}$$

↑ ↑  
accel

$$\frac{P_f - P_i}{Dt}$$

11.38



$$m_1 = 1000 \text{ gm}$$

$$v_1 = 10 \text{ m/sec}$$

$$m_2 = 60 \text{ gm}$$

$$v_2 = -20 \text{ m/sec}$$

$$v_3 = 40 \text{ m/sec}$$

$$\Delta p = (40 - (-20)) \cdot 60$$

$$(60 \text{ m/sec}) (60)$$

$$\Delta p = 3600 \text{ gm} \frac{\text{m}}{\text{sec}}$$

$$F = \frac{\Delta p}{Dt} = \frac{3600 \text{ gm m/sec}}{10 \text{ msec}}$$

$$10^{-3} \text{ kg}$$

$$10^{-7} \text{ sec}$$

$$= 360 \text{ } \approx \frac{\text{m}}{\text{sec}^2}$$

$$a = \frac{F}{.06 \text{ kg}} = \frac{360}{.06} \text{ m/sec}^2 = 6000 \text{ m/sec}^2$$

$$g \approx 10 \text{ m/sec}^2$$

$$\{ 1600 g's \}$$

