

FOR SIMPLE MACHINES:

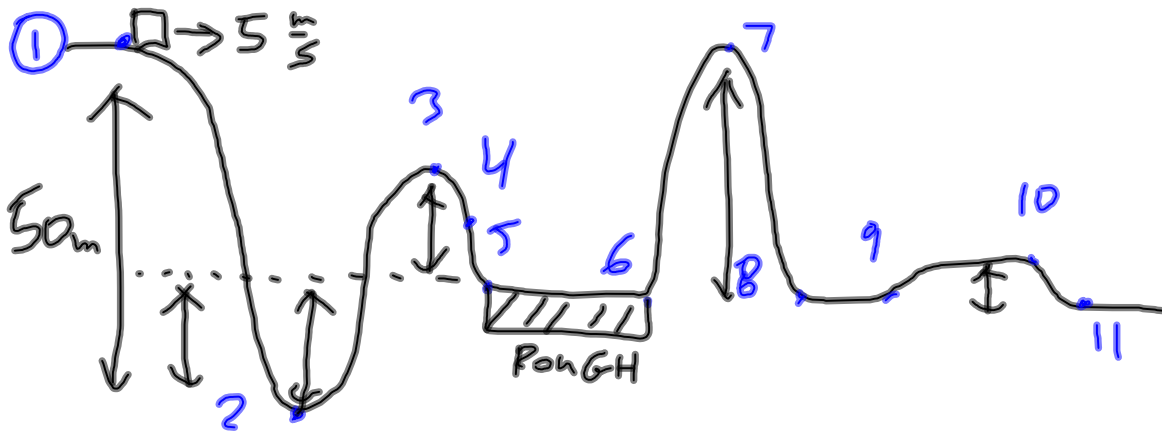
$IMA > MA \Rightarrow$ BECAUSE THERE IS FRICTION.

SAY, $\mu_k = 0$ (NO FRICTION)

$$IMA = MA$$

$$\frac{d_{in}}{d_{out}} = \frac{F_{out}}{F_{in}}$$

Jan 14-3:08 PM



$V_{11} = ?$

C of E ①-⑪

$$ME_1 + W_{Net} = ME_{11}$$

$$KE_1 + PE_{g1} + W_{56} = KE_{11} + PE_{g11}$$

Jan 14-3:09 PM

85 S.M.

$$d_{in} = 18 \text{ m}$$

$$d_{out} = 4.5 \text{ m}$$

$$F_{in} = ?$$

$$F_{out} = (25)(10) = 250 \text{ N}$$

$$e = ?$$

a) NO FRICTION \Rightarrow IMA = MA

$$\frac{d_{in}}{d_{out}} = \frac{F_{out}}{F_{in}}$$

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$$b) \text{ IMA} = \frac{d_{in}}{d_{out}}$$

$$\text{ IMA} = \frac{18}{4.5}$$

$$\boxed{\text{ IMA} = 4}$$

$$c) \text{ MA} = \frac{F_{out}}{F_{in}}$$

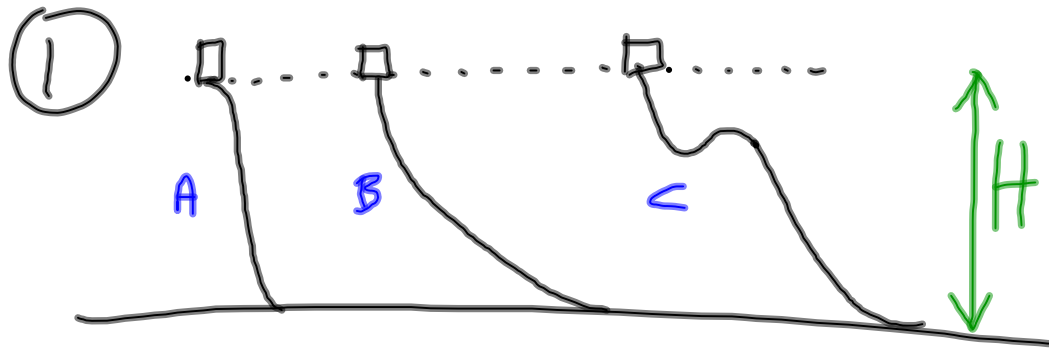
$$\text{ MA} = \frac{250}{75}$$

$$\boxed{\text{ MA} = 3.3}$$

$$e = \frac{\text{MA}}{\text{IMA}} \times 100$$

$$e = \frac{3.3}{4} \times 100 \quad \boxed{e = 82\%}$$

Jan 14-9:28 AM



a) Rank the speed of the person at the bottom from greatest to least, assuming there is no friction.

b) Rank with friction.

a) $V_A = V_B = V_C$ ME is conserved!

b) $ME_{\text{top}} + W_{\text{fr}} = ME_{\text{bot}}$ $W_{\text{fr}} = F_{\text{fr}} \cdot d \cdot \cos(180^\circ)$

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$$d_C > d_B > d_A$$

$$W_C > W_B > W_A$$

$$ME_{\text{top}} - W = ME_{\text{bot}}$$

$$ME_A > ME_B > ME_C$$

$$V_A > V_B > V_C$$

Jan 14-9:43 AM

②

$F_g = 50\text{N}$

$F_{IN} = ?$

$IMA = 1$

$F_{IN} = 50\text{N}$

Jan 14-9:46 AM

③

①

②

$h = 0$

H

a) $\mu_k = 0$ $W_1 = W_2$

b) $\mu_k \neq 0$ $W_1 < W_2$

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4. Is force of gravity a conservative or non-conservative force?

To answer this you need to calculate work done by the force over certain displacement and on the way back; add both and if the net work is zero then the force is conservative.

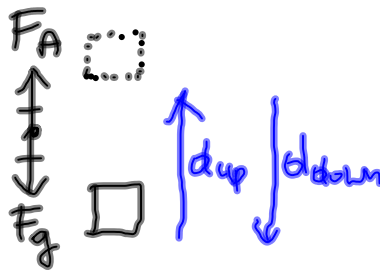


Diagram illustrating the forces and displacement for a square object. The forces shown are F_A (upward) and F_g (downward). The displacement vectors are d_{up} (upward) and d_{down} (downward).

$$W_{up} = F_g \cdot d_{up} \cdot \cos(180^\circ) = -\#$$

$$W_{down} = F_g \cdot d_{down} \cdot \cos(0^\circ) = +\#$$

$$W_{Net} = W_{up} + W_{down} = \emptyset$$

CONSERVATIVE!

Jan 14-9:57 AM