

You may work in groups. You may use your book. You may not use the internet.

Particle A (of mass  $m$ ) is released from rest at elevation 1. Particle B (of mass  $m$  and connected to lightweight bar OB) is also released from rest at elevation 1. Circle the answer below that correctly describes the speeds of A and B ( $v_{A2}$  and  $v_{B2}$ , respectively) at elevation 2.

(a)  $v_{A2} > v_{B2}$   
 (b)  $v_{A2} = v_{B2}$   
 (c)  $v_{A2} < v_{B2}$

A:  $T_2 = \sqrt{v_1}$   
 $\frac{1}{2} m v_{A2}^2 = m g L$

OB:  $T_2 = \sqrt{v_1} \Rightarrow v_{A2} = v_{B2}$   
 $\frac{1}{2} m v_{B2}^2 = m g L$

Justify your response with equations and/or words.

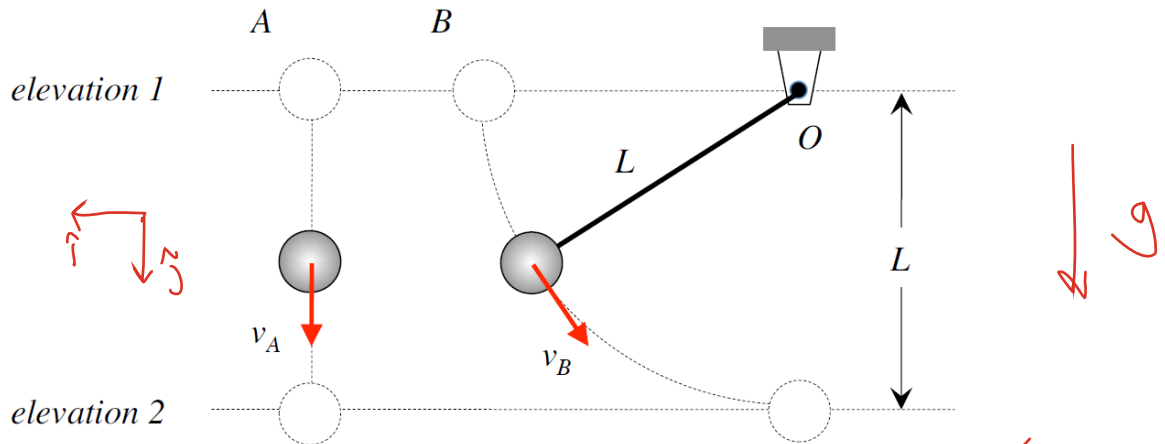
Circle the answer below that correctly describes the times required for A and B to reach elevation 2 ( $t_{A2}$  and  $t_{B2}$ , respectively).

(a)  $t_{A2} > t_{B2}$   
 (b)  $t_{A2} = t_{B2}$   
 (c)  $t_{A2} < t_{B2}$

A:  $\sum F_y = m a_{Ay} = m g$   
 B:  $\sum F_y = m a_{By} = m g - T \sin \theta$

$\Rightarrow a_{A \uparrow} > a_{B \uparrow}$   
 $\downarrow$   
 $t_{A2} < t_{B2}$

Justify your response with equations and/or words.



① FBD

