

Těleso klouže po nakloněné rovině bez tření a odp. VBD. Jak dlouho? Jakou získá rychlost?

Kabar 65 :

$$a = g \cdot \sin \alpha$$

konst \rightarrow RZP

$$\begin{aligned} h &= 4 \text{ m} \\ l &= 5 \text{ m} \\ t &= ? \\ v_{\text{max}} &= ? \end{aligned}$$

$$\textcircled{1} \quad 2l = at^2 \quad | : a$$

$$t^2 = \frac{2l}{a} \quad | \sqrt{\quad}$$

$$t = \sqrt{\frac{2l}{a}}$$

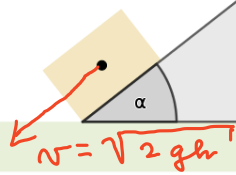
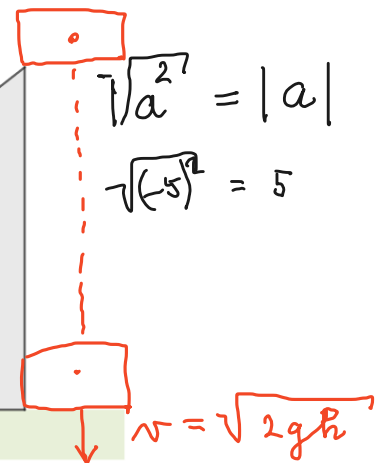
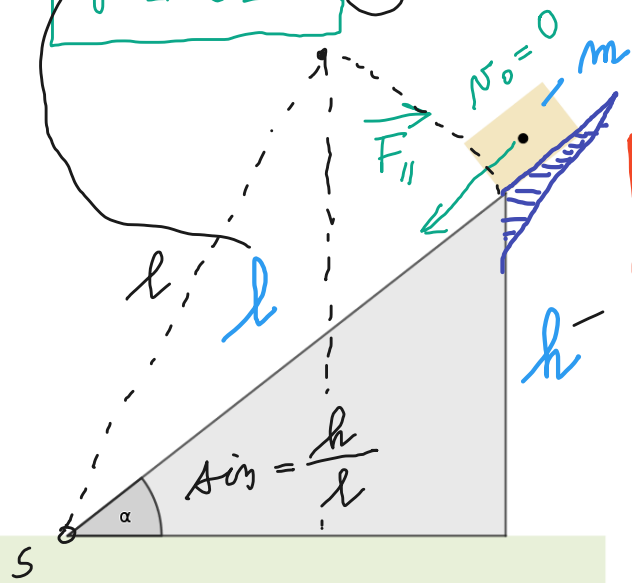
$$t = \sqrt{\frac{2l}{g \sin \alpha}}$$

$$t = \sqrt{\frac{2l \cdot l}{g \cdot h}} = \sqrt{\frac{2l^2}{gh}}$$

$$t = l \cdot \sqrt{\frac{2}{gh}}$$

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$$\begin{aligned} \textcircled{1} \quad s &= \frac{1}{2} at^2 \\ \textcircled{2} \quad v &= at \end{aligned}$$



$$\begin{aligned} \sqrt{a^2} &= |a| \\ \sqrt{(-5)^2} &= 5 \end{aligned}$$

$$t = l \sqrt{\frac{2}{gh}} = 5 \sqrt{\frac{2}{10 \cdot 4}} = 5 \frac{1}{\sqrt{20}} = \frac{5}{2\sqrt{5}} =$$

$$= \frac{\cancel{5}\sqrt{5}}{2 \cdot \cancel{5}} = \frac{\sqrt{5}}{2} \text{ [s]}$$

$$a = g \sin \alpha = g \frac{h}{l} = 10 \cdot \frac{4}{5} = 8 \left[\frac{\text{m}}{\text{s}^2} \right]$$

$$s = \frac{1}{2} a t^2$$

$$5 = \frac{1}{2} \cdot 8 \cdot t^2$$

$$5 = 4t^2 \rightarrow t^2 = \frac{5}{4} \rightarrow t = \frac{\sqrt{5}}{2} \text{ [s]}$$

$$v = at = g \underbrace{\sin \alpha}_{\frac{h}{l}} \cdot \sqrt{\frac{2}{gh}} =$$

$$= g \frac{h}{l} \cdot \cancel{l} \sqrt{\frac{2}{gh}} = gh \sqrt{\frac{2}{gh}} = \sqrt{g \cancel{h} \frac{2}{\cancel{gh}}} = \sqrt{2gh}$$

$$v = \sqrt{2 \cdot 10 \cdot 4} = \sqrt{80} = \sqrt{4 \cdot 4 \cdot 5} =$$

$$= 4\sqrt{5} \left[\frac{\text{m}}{\text{s}} \right]$$

BAVÍ!