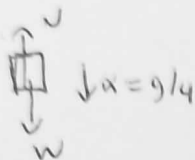


Θέμα 1ο

1. δ 2. γ 3. α 4. β

Θέμα 2ο

1.



$$W - N = m a \Rightarrow$$

$$N = W - m a = m g - m \frac{g}{4} = \frac{3}{4} m g = \frac{3}{4} \beta$$

(β)

2.



$$\sum F_x = 0$$

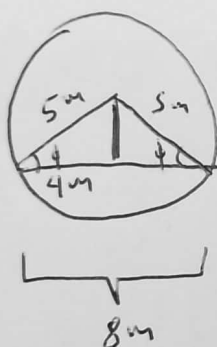
$$N_{1x} = N_{2y} \Rightarrow N_1 \sin 30^\circ = N_2 \cos 60^\circ \quad (1)$$

$$\sum F_y = 0 \Rightarrow N_{1y} + N_{2y} = W$$

$$N_1 \cos 30^\circ + N_2 \sin 60^\circ = W \stackrel{(1)}{\Rightarrow} 2 N_1 \cos 30^\circ = W \quad (2)$$

$$\cos 30^\circ = \frac{3}{5} = 0.6 \quad (2) \Rightarrow N_1 = \frac{30}{2 \cdot 0.6} = 25 \text{ N}$$

(β)



Θέμα 3ο

α) Για να ξεκινήσει το βήμα πρέπει:

$$F + W_x \geq T_{\text{static}} + T_{\text{static}}$$

$$F + W \cos \phi \geq T_{\text{top}} + \mu_s W_y \Rightarrow F \geq 30 + 0.5 \cdot 50 \cdot 0.8 - 50 \cdot 0.6$$

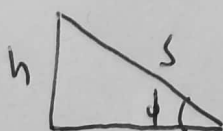
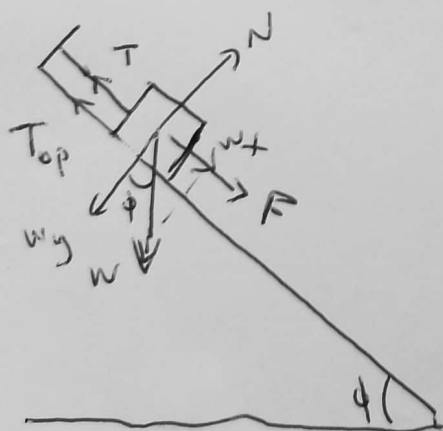
$$\Rightarrow F \geq 20 \text{ N}$$

$$\beta) \alpha = \frac{F + W_x - T_{\text{on}}}{m} = \frac{F + W \cos \phi - \mu W_y}{m} \quad (1)$$

$$\gamma) \sin \phi = \frac{h}{s} \Rightarrow s = \frac{h}{\sin \phi} = \frac{4}{0.6} = \frac{40}{6}$$

$$s = \frac{1}{2} \alpha t^2 \Rightarrow t = \sqrt{\frac{2s}{\alpha}} \quad (2)$$

$$v = \alpha t \stackrel{(1)}{\stackrel{(2)}}{\Rightarrow} v = \dots$$



ΟΜΑΔΑ Β

Θέμα 1ο

1. δ

2. γ

3. α

4. ε

Θέμα 2ο

1.



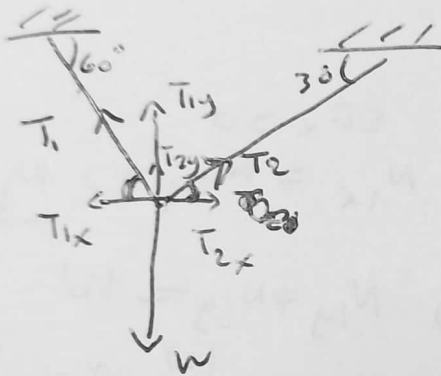
$\uparrow \alpha = g/4$

$$N - w = m \cdot \alpha \Rightarrow N = w + m \cdot \frac{g}{4}$$

$$N = mg + m \frac{g}{4} \Rightarrow N = \frac{5}{4} mg = \frac{5}{4} w$$

(8)

2.



$$\sum F_x = 0 \Rightarrow T_{1x} = T_{2x}$$

$$\Rightarrow T_1 \cos 60^\circ = T_2 \cos 30^\circ$$

$$\Rightarrow T_1 \frac{1}{2} = T_2 \frac{\sqrt{3}}{2} \Rightarrow$$

$$\Rightarrow \boxed{\frac{T_1}{T_2} = \sqrt{3}}$$

(α.)

Θέμα 3ο

Ποιόντων οπότε Α.