$m = 20kg$

$F_1 = 10\ N$

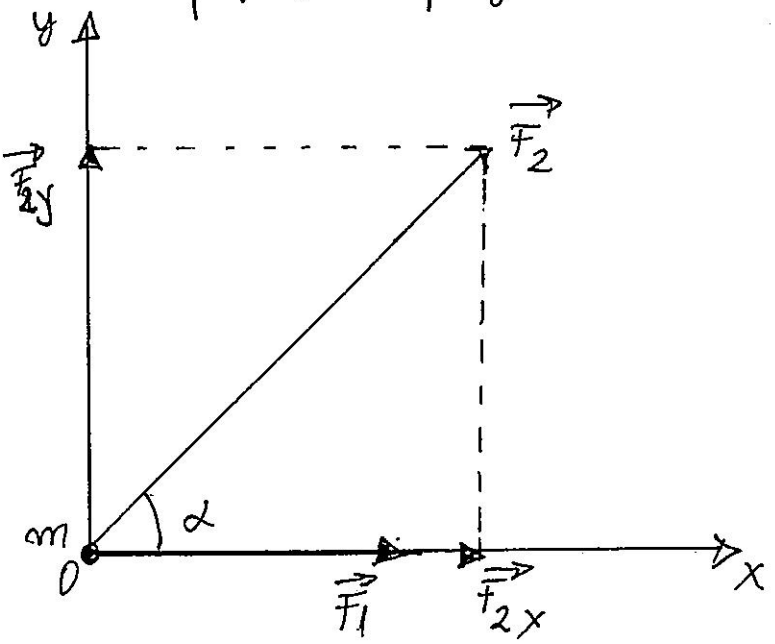
$F_2 = 20\sqrt{2}\ N$

$\alpha = 45^\circ$

1) $\vec{R} = ?$

2) $R = ?$

3) $a = ?$



pe Ox: $\vec{R}_x = \vec{F}_1 + \vec{F}_{2x}$ unde $F_{2x} = F_2 \cos\alpha$

$R_x = F_1 + F_{2x}$

pe Oy: $\vec{R}_y = \vec{F}_{2y}$

$R_y = F_{2y} = F_2 \sin\alpha$

$F_{2x} = F_2 \cos 45^\circ =$

$F_{2x} = 20\sqrt{2}\ \frac{\sqrt{2}}{2} = 20\ N$

$F_{2y} = F_2 \sin 45^\circ$

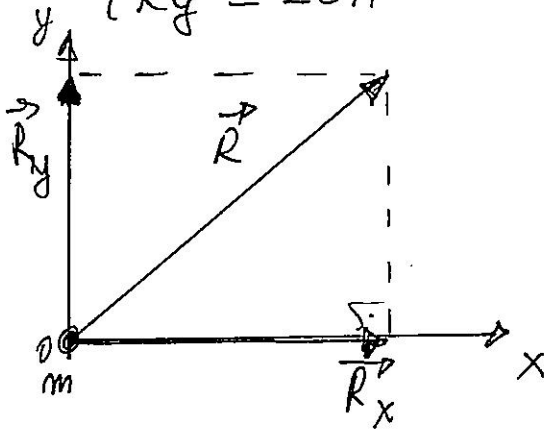
$F_{2y} = 20\sqrt{2}\ \frac{\sqrt{2}}{2} = 20\ N$

$\Rightarrow \begin{cases} R_x = 10 + 20 = 30N \\ R_y = 20N \end{cases}$

1) $\vec{R} = \vec{R}_x + \vec{R}_y$

2) $R = \sqrt{R_x^2 + R_y^2}$

$R = \sqrt{30^2 + 20^2} = 36\ N$



3) $a = \frac{R}{m} = \frac{36}{20}$ ($R = ma$)

$a = 1{,}8\ m/s^2$

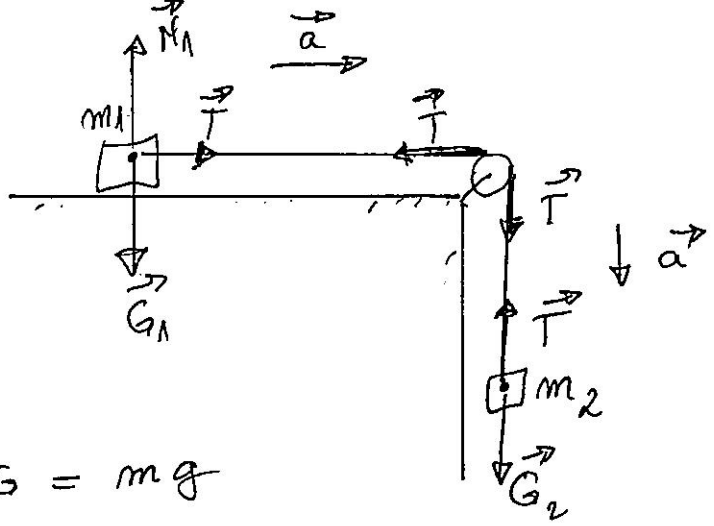
(2) $m_1 = 4\,kg$

$m_2 = 6\,kg$

$g = 10\,m/s^2$

1) $a = ?$

2) $T = ?$



$G = mg$

$G_1 = m_1 g$

$G_2 = m_2 g$

corpul 1 $\begin{cases} \text{pe direcția normalei } \vec{N_1}: & N_1 = G_1 \\ \text{pe direcția firului}: & m_1 a = T \end{cases}$

corpul 2 pe direcția firului: $m_2 a = G_2 - T$

$$\begin{cases} m_1 a = T \\ m_2 a = G_2 - T \end{cases}$$

$m_1 a + m_2 a = G_2$

$(m_1 + m_2) a = G_2$

$a = \dfrac{G_2}{m_1 + m_2}$

1) $a = \dfrac{m_2 g}{m_1 + m_2}$

$a = \dfrac{6 \cdot 10}{6+4} = \dfrac{60}{10} = 6\,m/s^2$

2) $m_1 a = T \Rightarrow T = 4 \cdot 6 = 24\,N$