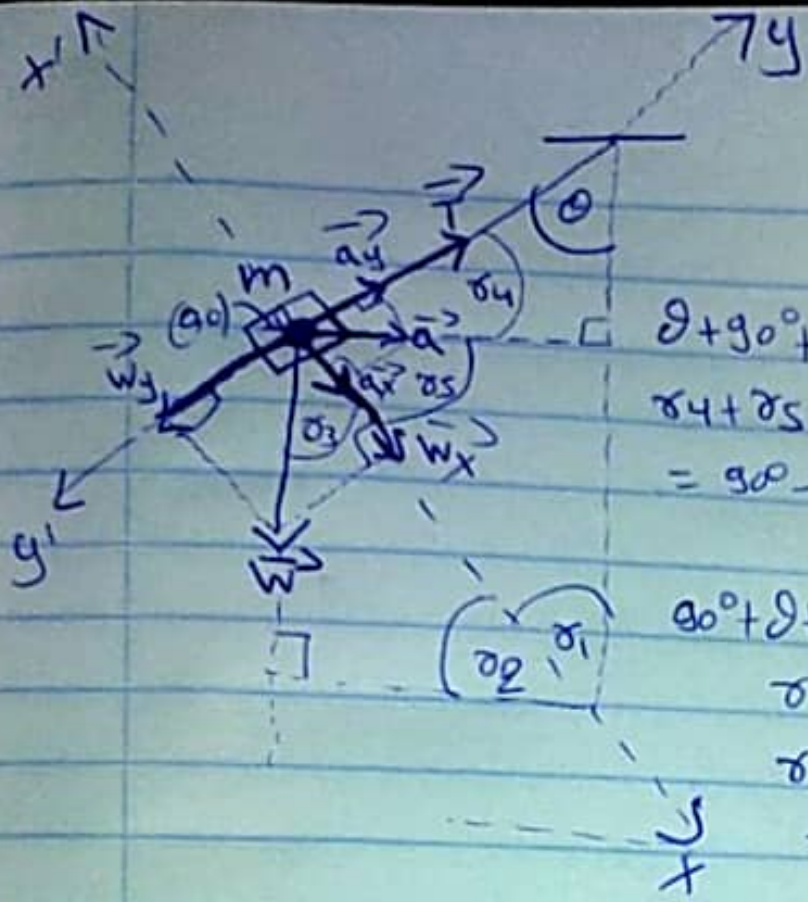

Calculating Angles

$\theta + 90° + \gamma_4 = 180° \Rightarrow \gamma_4 = 90° - \theta$

$\gamma_4 + \gamma_5 = 90° \Leftrightarrow \gamma_5 = 90° - \gamma_4$

$= 90° - 90° + \theta \Rightarrow \boxed{\gamma_5 = \theta}$

$90° + \theta + \gamma_1 = 180° \Rightarrow \gamma_1 = 180° - 90° - \theta$

$\gamma_1 = 90° - \theta$

$\gamma_1 + \gamma_2 = 90° \Rightarrow \gamma_2 = 90° - \gamma_1$

$= 90° - 90° + \theta \Rightarrow \gamma_2 = \theta$

$\gamma_3 + 90° + \gamma_2 = 180° \Rightarrow \gamma_3 = 90° - \gamma_2 = 90° - \theta \Rightarrow \boxed{\gamma_3 = 90° - \theta}$

Calculating $\vec{w_y}, \vec{w_x}, \vec{a_x}, \vec{a_y}$ in terms of cos and sin

$\cos(\gamma_3) = \frac{\vec{w_x}}{|\vec{w}|} \Rightarrow \vec{w_x} = |\vec{w}| \cdot \cos(\gamma_3)$

$= m \cdot g \cdot \cos(90° - \theta) \Rightarrow \boxed{\vec{w_x} = m \cdot g \cdot \sin(\theta)}$ (1)

$\sin(\gamma_3) = \frac{\vec{w_y}}{|\vec{w}|} \Rightarrow \vec{w_y} = |\vec{w}| \cdot \sin(\gamma_3)$

$\Rightarrow \vec{w_y} = m \cdot g \cdot \sin(90° - \theta) \Rightarrow \boxed{\vec{w_y} = m \cdot g \cdot \cos(\theta)}$ (2)

$\cos(\gamma_5) = \frac{\vec{a_x}}{|\vec{a}|} \Rightarrow \vec{a_x} = |\vec{a}| \cdot \cos(\gamma_5) = |\vec{a}| \cdot \cos(\theta)$

$\Rightarrow \boxed{\vec{a_x} = |\vec{a}| \cdot \cos(\theta)}$ (3) $\quad \boxed{\vec{a_y} = |\vec{a}| \cdot \sin(\theta)}$ (4)

Newton's Law

$$\vec{\Sigma F_x} = m \cdot \vec{a_x} \iff \vec{w_x} = m \cdot \vec{a_x} \iff m \cdot g \cdot \sin(\theta) = m \cdot |\vec{a}| \cdot \cos(\theta)$$

$$\iff g \cdot \sin(\theta) = |\vec{a}| \cdot \cos(\theta) \Rightarrow |\vec{a}| = g \frac{\sin(\theta)}{\cos(\theta)}$$

$$\Rightarrow \boxed{|\vec{a}| = g \cdot \tan(\theta)} \quad (5)$$

$$\vec{\Sigma F_y} = m \cdot \vec{a_y} \iff \vec{w_y} + \vec{T} = m \cdot \vec{a_y}$$

$$\iff m \cdot g \cdot \cos(\theta) + |\vec{T}| = m \cdot |\vec{a}| \cdot \sin(\theta)$$

$$\Rightarrow |\vec{T}| = m \cdot |\vec{a}| \cdot \sin(\theta) - m \cdot g \cdot \cos(\theta)$$

$$\Rightarrow |\vec{T}| = m \cdot g \cdot \tan(\theta) \cdot \sin(\theta) - m \cdot g \cdot \cos(\theta)$$

$$\Rightarrow \boxed{|\vec{T}| = m \cdot g \left[\tan(\theta) \cdot \sin(\theta) - \cos(\theta) \right]} \quad (6)$$