

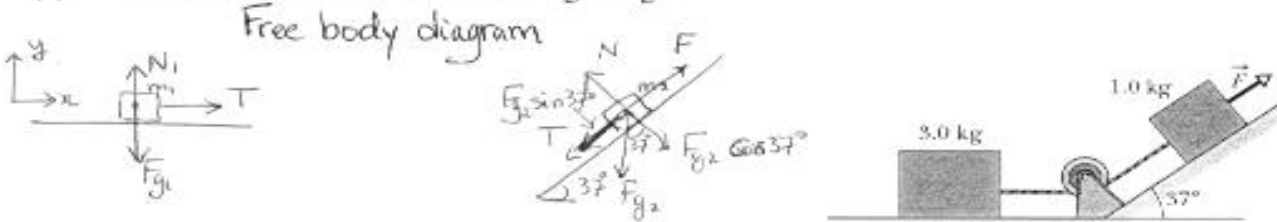
Physics 101-Rec
Quizz # 4

Instructor: Dr. Mekki

Name: Key Id#: _____ Sect.#: _____

In the figure take the force $F = 12 \text{ N}$.

(a) What is the tension in the connecting string?



mass m_1 :

$$\sum \vec{F}_x = m_1 a \Rightarrow T = m_1 a \quad (1)$$

$$\sum \vec{F}_y = 0 \Rightarrow N - F_{g1} = 0$$

mass m_2 :

$$\sum \vec{F}_x = m_2 a \Rightarrow F - T - F_{g2} \sin \theta = m_2 a \quad (2)$$

$$\sum \vec{F}_y = N - F_{g2} \cos \theta = 0$$

(3) into (1) $\Rightarrow T = 3 \times 1.5 = \boxed{4.5 \text{ N}}$

(b) What is the acceleration of the blocks?

$$(1) + (2) \Rightarrow F - F_{g2} \sin \theta = (m_1 + m_2) a$$

$$\Rightarrow a = \frac{F - m_2 g \sin 37^\circ}{m_1 + m_2}$$

$$= \frac{12 - (1)(9.8) \sin 37^\circ}{4} = \boxed{1.5 \text{ m/s}^2} \quad (3)$$