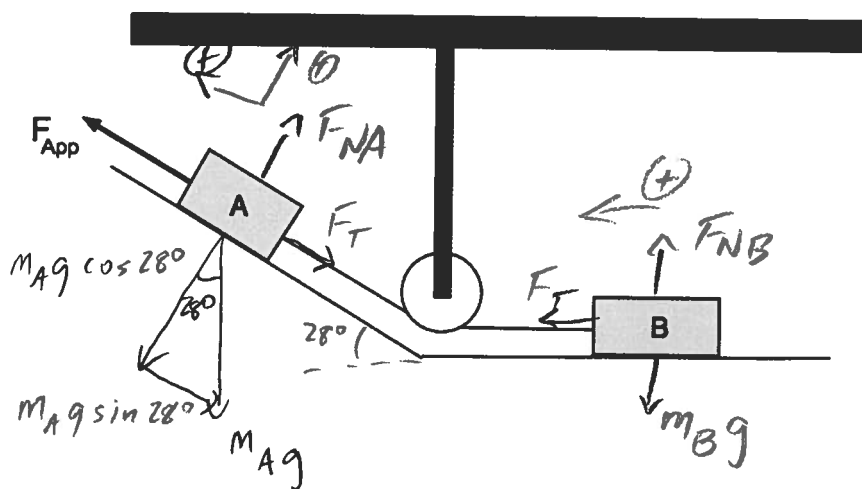


Physics 10154 - Quiz 4A

Mass A (7.0 kg) and Mass B (5.5 kg) are connected by a thin string as shown below. Mass A is on a ramp inclined 28° above the horizontal while B is on a horizontal surface. Both surfaces are frictionless. An applied force of 47 N is directed up the ramp, causing the mass A to slide up the ramp and mass B to slide to the left as the string stays taut, ensuring both masses move with the same speed and acceleration.

Find (a) the value of the acceleration felt by mass A and (b) the tension in the string connecting the two masses.



$$m_A : \Sigma F_{\parallel} = F_{App} - m_A g \sin 28 - (F_T) = m_A a$$

$$m_B : \Sigma F_x = F_T = (m_B a)$$

$$F_{App} - m_A g \sin 28^\circ - m_B a = m_A a$$

$$47 - 32.2 = (7.0 + 5.5) a$$

$$\Rightarrow \boxed{a = 1.2 \text{ m/s}^2}$$

$$b) F_T = m_B a = (5.5)(1.1835) = \boxed{6.5 \text{ N}}$$