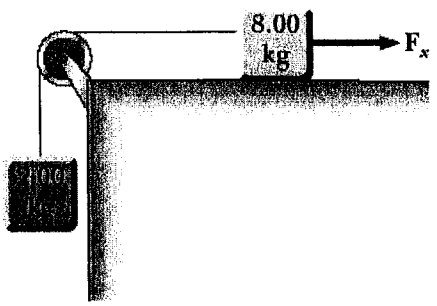
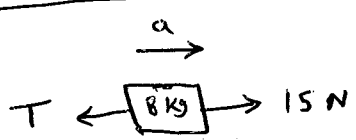
Phys 101 – Sec # 37 **Quiz # 3 (Ch. 5)**

Name: key **ID #**

In the system shown, a horizontal force F_x = 15 N acts on the 8.00-kg object to the right. The horizontal surface is frictionless. (a) Find the magnitude and direction of the acceleration. (b) Find the value of the tension in the cord?



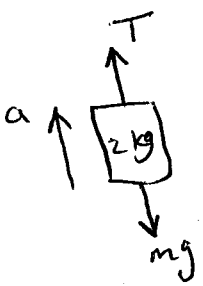
for the 8-kg object



$\Sigma F_x = ma_x$

$\boxed{15 - T = 8a}$ ①

for the 2-kg object



$\Sigma F_y = ma_y$

$\boxed{T - 2g = 2a}$ ②

add ① + ② ⇒

$15 - 2g = 10a$

$a = \dfrac{15 - 19.6}{10} = \boxed{-0.46\ m/s^2}$

$|a| = 0.46\ m/s^2$

direction: 8-kg will accelerate to the left, and the 2-kg will accelerate downward.

$\vec{a}$ is -ve ⇒ opposite to the direction we proposed at the beginning.

b) Plug $a = -0.46$ in ① to get T:-

$15 - T = -8(0.46)$

$T = 15 + 8(0.46)$

$\boxed{T = 18.68\ N}$