

ATWOOD machine problem.

A 2.0 kg and a 3.0 kg mass are attached to a lightweight cord that passes over a frictionless pulley. The hanging masses are free to move. Assume the positive direction of motion is when the larger mass moves downward.

- a) Draw a diagram showing all forces.
- b) In what direction does the smaller mass move and what is its accel?
- c) Find the tension in the cord.

$F_n = F_{gB} - F_{gA}$   
 $= m_B g - m_A g$   
 $= g(3-2)$   
 $F_n = 9.8 \text{ N}$

b) Tension (T) = ?  
 choose  $\uparrow T$   
 $F_n = F_{gB} - T$   
 $T = F_{gB} - F_n$   
 $= m_B g - m_B a$   
 $= 3g(9.8 - 1.96) = 23.52 \text{ N}$

$F_n = ma$   
 $a = \frac{F_n}{M}$   
 $a = \frac{9.8 \text{ N}}{2+3 \text{ kg}}$   
 $a = 1.96 \text{ m/s}^2$

Oct 24-8:51 AM