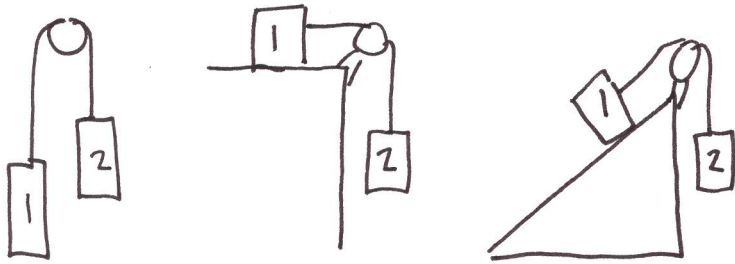


ATWOOD OR PULLEY PROBLEMS



TENSION (T) - FORCE FROM A ROPE OR STRING

TENSION IN ROPE IS SAME THROUGHOUT

NO MATTER WHAT THEY ASK US TO SOLVE FOR (acceleration, mass of a block, Tension in string, friction...)

***MUST FIND ACCELERATION OF SYSTEM FIRST!

SYSTEM → ALL MASSES INVOLVED

TO FIND ACCELERATION OF SYSTEM

LABEL EXTERNAL FORCES ON SYSTEM

mg, F_N, F_f (RAMP $mg \sin \theta$ $mg \cos \theta$)

NOT TENSION

SET UP $\Sigma F = ma$

FOR SYSTEM

*MASS OF SYSTEM IS ALL MASSES ADDED UP

TO FIND AN INTERNAL FORCE

TENSION (T)

MAKE SURE WE HAVE ACCELERATION OF SYSTEM/OBJECTS

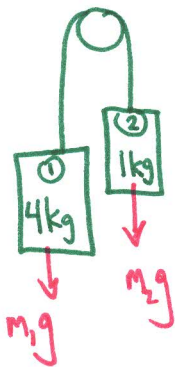
JUST LOOK AT ONE OBJECT IN THE SYSTEM, THEN DRAW F.B.D. FOR THAT ONE OBJECT

*TIP: CHOOSE AN OBJECT THAT GOES UP.

SET UP $\Sigma F = ma$ *BE CAREFUL OF SIGNS (+/-)

EXAMPLE:

WHAT IS a ?



$$\Sigma F = ma$$

$$m_1g - m_2g = (m_1 + m_2)a$$

$$(4\text{kg})(9.8 \frac{\text{m}}{\text{s}^2}) - (1\text{kg})(9.8 \frac{\text{m}}{\text{s}^2}) = (4 + 1\text{kg})a$$

$$39.2 - 9.8 = 5a$$

$$\frac{29.4}{5} = \frac{5a}{5}$$

$$a = 5.88 \frac{\text{m}}{\text{s}^2}$$

EXAMPLE:

WHAT IS TENSION IN STRING?



$$\Sigma F = ma$$

$$T - m_2g = ma$$

$$T - (1\text{kg})(9.8 \frac{\text{m}}{\text{s}^2}) = (1\text{kg})(5.88 \frac{\text{m}}{\text{s}^2})$$

$$T - 9.8\text{N} = 5.88\text{N}$$

$$T = 15.68\text{N}$$