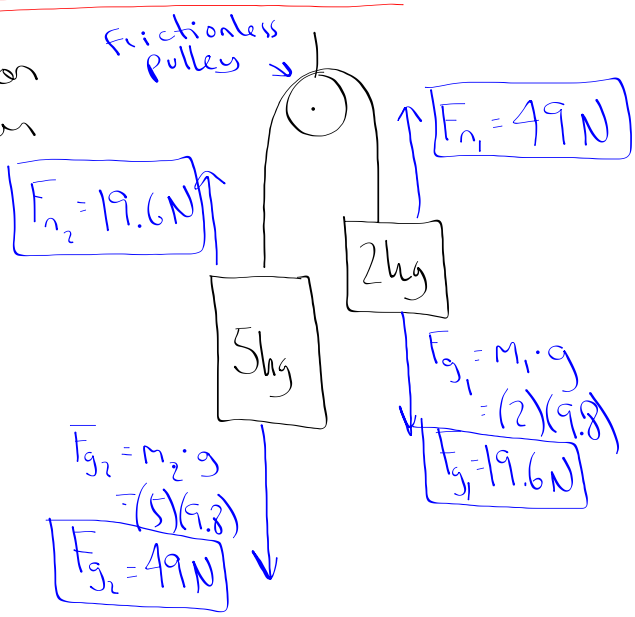
Force Resolution For 2 masses

Goal: Calculate acceleration of the pulley system



$F_{net} = F_{g_2} - F_{n_2}$

$= 49 - 19.6$

$F_{net} = 29.4\,N$

$F_{net} = M \cdot a$

$a = \frac{F_{net}}{m_1 + m_2} = \frac{29.4\,N}{5+2}$

$a = 4.2\,m/s^2$

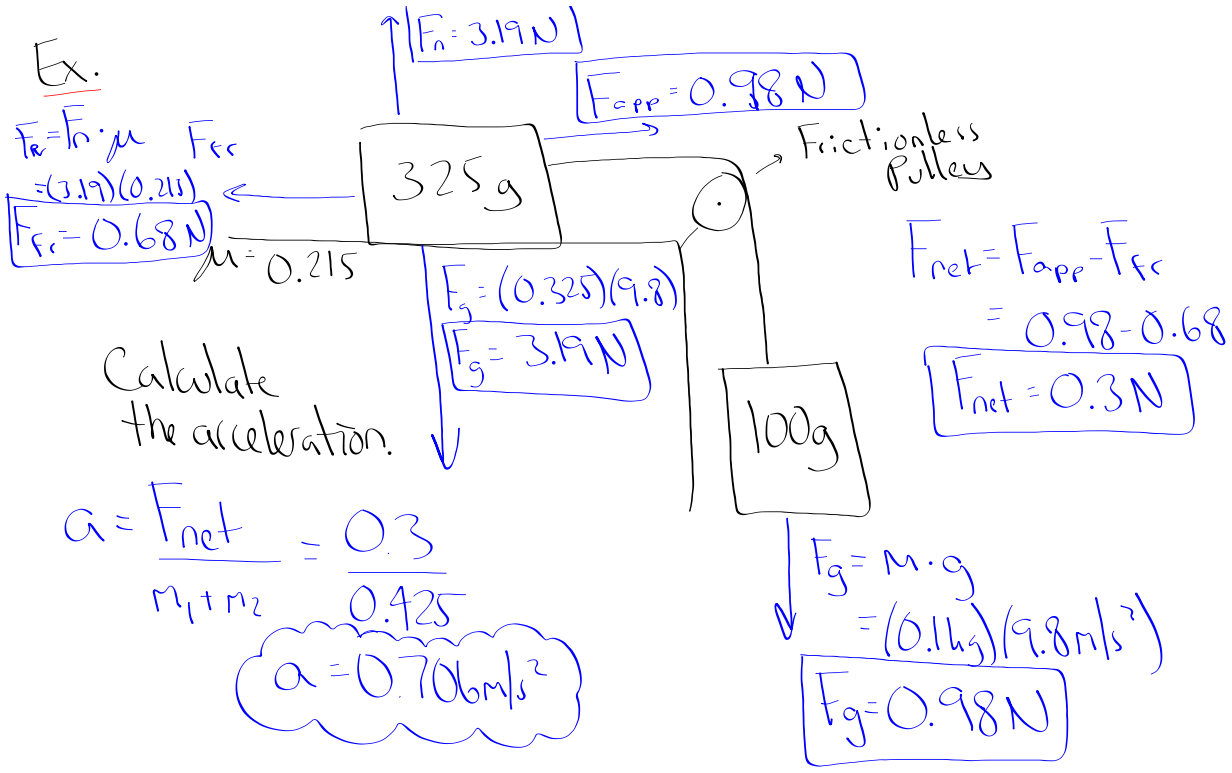
Note: Tension

$$T = \frac{2 g m_1 m_2}{m_1 + m_2}$$

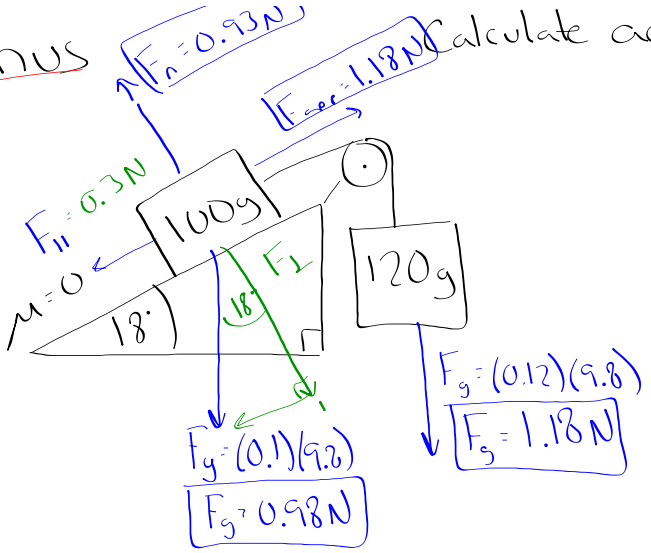
$T = \frac{2(9.8)(2)(5)}{2+5}$

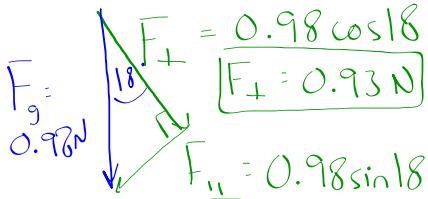
$T = 28\,N$

Ex.


$F_n = 3.19\,N$
$F_{app} = 0.98\,N$
325 g
Frictionless pulley
$F_{fr} = F_n \cdot \mu$
$= (3.19)(0.215)$
$F_{fr} = 0.68\,N$
$\mu = 0.215$
$F_g = (0.325)(9.8)$
$F_g = 3.19\,N$
100g
$F_{net} = F_{app} - F_{fr}$
$= 0.98 - 0.68$
$F_{net} = 0.3\,N$
Calculate the acceleration.
$a = \frac{F_{net}}{m_1 + m_2} = \frac{0.3}{0.425}$
$a = 0.706\,m/s^2$
$F_g = m \cdot g$
$= (0.1kg)(9.8\,m/s^2)$
$F_g = 0.98\,N$

Bonus Calculate acceleration





$F_{net} = F_{app} - F_{11}$

$= 1.18 - 0.3$

$F_{net} = 0.88N$

$F_{net} = m \cdot a$

$a = \frac{F_{net}}{m_1 + m_2} = \frac{0.88}{0.22}$

$a = 4 m/s^2$