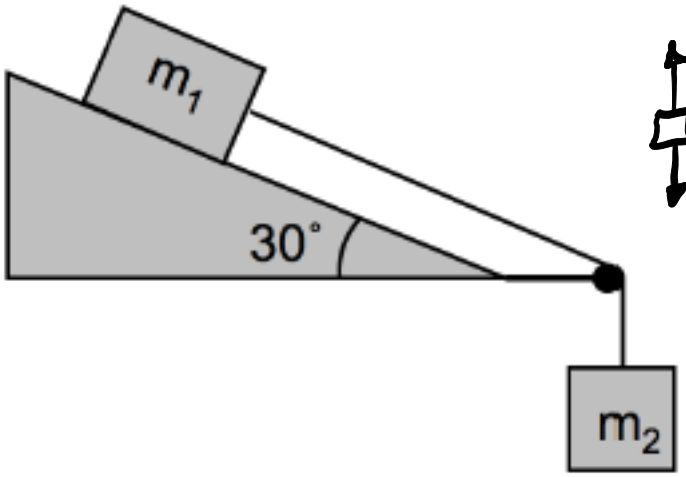
Quiz 3 (20 points

(3) **[10 points]** An object of mass m_1 = 4 kg placed on a ***frictionless*** incline plane is connected to a string that passes over a pulley and then is fastened to a hanging object of mass m_2 = 3 kg as shown below. Consider the string and pulley to be massless and frictionless.
Determine the acceleration of m_2 ($g=10\ m/s^2$).



$F_{g_1} = m_1 g = 4 \cdot 10 = 40$

$F_{g_2} = m_2 g = 3 \cdot 10 = 30$

$F = F_{g_1} \sin 30 + F_{g_2}$

$= 40 \sin 30 + 30 = 50$

$a_2 = \frac{F}{m_2} = \frac{50}{3} = 16.67\ m/s^2$