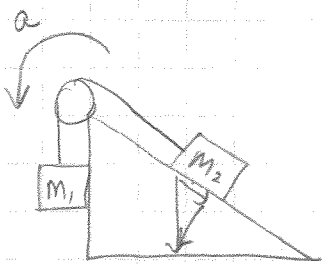
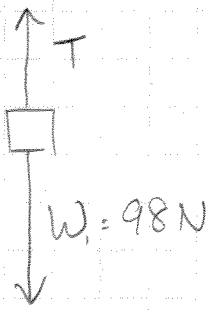
P #26

$m_1 = 10\ kg$
$m_2 = 5\ kg$

$W_1 = 98\ N$
$W_2 = 49\ N$



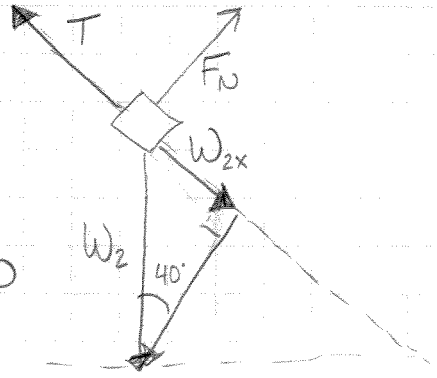
For m_1:



$F_{Net} = W_1 - T = m_1 \cdot a$

$98\ N - T = (10\ kg) \cdot a$

For m_2:



$F_{Net} = T - W_{2x} = m_2 \cdot a$

$T - 31.5\ N = (5\ kg) \cdot a$

$W_{2x} = W_2 \cdot \sin\theta$

$= (49\ N) \sin 40$

$W_{2x} = 31.5\ N$

So...

$98\ N - T = (10\ kg) \cdot a$
$T - 31.5\ N = (5\ kg) \cdot a$

$T = (5\ kg)a + 31.5\ N$

$98\ N - [(5\ kg) \cdot a + 31.5\ N] = (10\ kg) \cdot a$

$\boxed{a = 4.43\ m/s^2}$

Substituting...

$T = (5\ kg) \cdot a + 31.5\ N$

$= (5\ kg)(4.43\ m/s^2) + 31.5\ N$

$\boxed{T = 53.7\ N}$