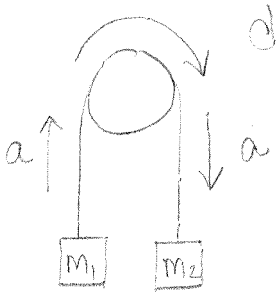
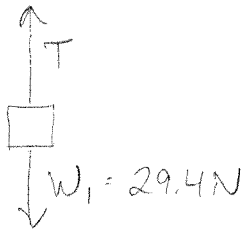
P # 34

$m_1 = 3\,kg$
$m_2 = 5\,kg$

$W_1 = 29.4\,N$
$W_2 = 49.0\,N$



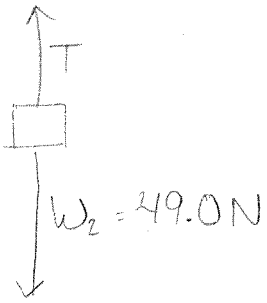
For m_1:



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

$= T - 29.4\,N = (3\,kg) \cdot a$

For m_2:



$F_{NET} = W_2 - T = m_2 \cdot a$

$= 49.0N - T = (5\,kg) \cdot a$

b) Substituting... $T = (3\,kg) \cdot a + 29.4\,N$

so $49.0\,N - [(3\,kg) \cdot a + 29.4\,N] = (5\,kg) \cdot a$

$19.6\,N = (8\,kg) \cdot a$

$$\boxed{a = 2.45\ m/s^2}$$

a) For Tension... $T = (3\,kg) \cdot a + 29.4\,N$

$= (3\,kg)(2.45\ m/s^2) + 29.4\,N$

$$\boxed{T = 36.8\,N}$$

c) $t = 1.0\,sec$
$a = 2.45\ m/s^2$
$d = ?$

$d = \frac{1}{2} \cdot a \cdot t^2$

$= \frac{1}{2}(2.45\ m/s^2)(1.0\,sec)^2$

$$\boxed{d = 1.23\,m}$$