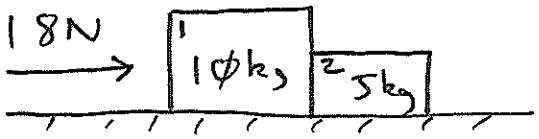
F_{app}



No friction

What is the acceleration?

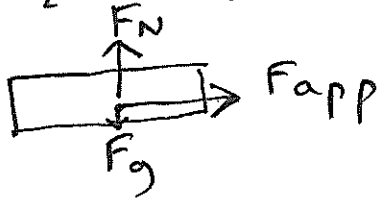
$F_{net} =$

$F_{net} = F_{app} = 18N$

FBD

$m_1 = 10kg$

$m_2 = 5\ kg$



$m_{sys} = m_1 + m_2$

$= 15\ kg$

$a_{sys} = \frac{F_{net}}{m_{sys}} = \frac{18N}{15\ kg}$

$= \underline{1.20\ ms^{-2}}$

$F_{net1} = (m_1 a_1) \quad a_1 = a_{sys}$

$= (10kg)(1.20\ m/s^{-2})$

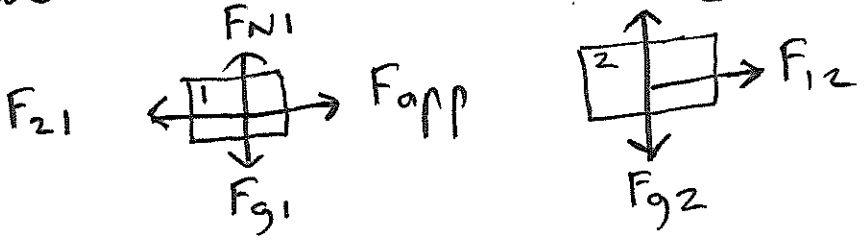
$= 12N$

$F_{net2} = m_2 a_2$

$= (5kg)(1.20\ m/s^{-2})$

$= 6N$

Magnitude of the action-reaction contact forces between the 2 boxes?



$F_{net_1} = 12N$

$F_{net_1} = F_{21} + F_{app}$

$F_{21} = F_{net_1} - F_{app}$

$= -6N$

$F_{net_2} = 6N$

$F_{net_2} = F_{12}$

$\therefore F_{12} = 6N$

Find a frictional force

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

Frictional force between Jacks feet and the floor = $F_{app} = F_{reaction}$

N.B. Size + direction of resultant force on box (1) on box (2)

$\Downarrow a_2$

$m_2 \times a_2$