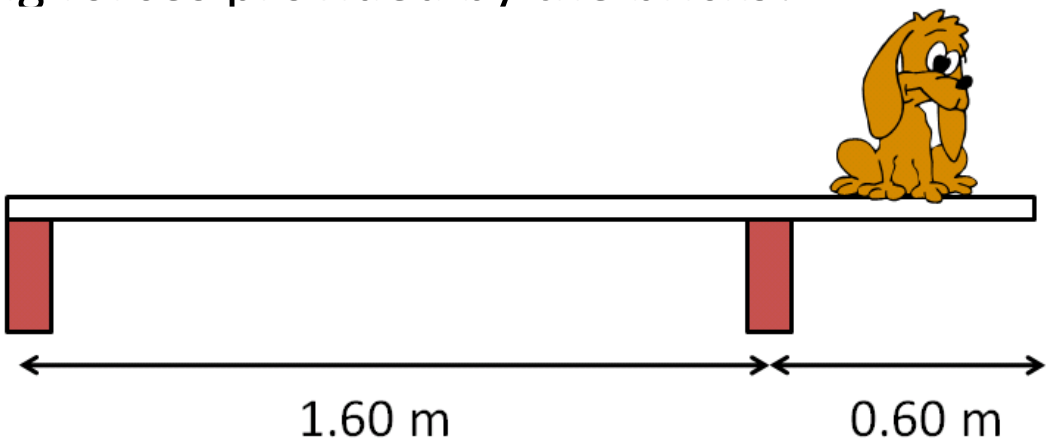
Quiz 3a

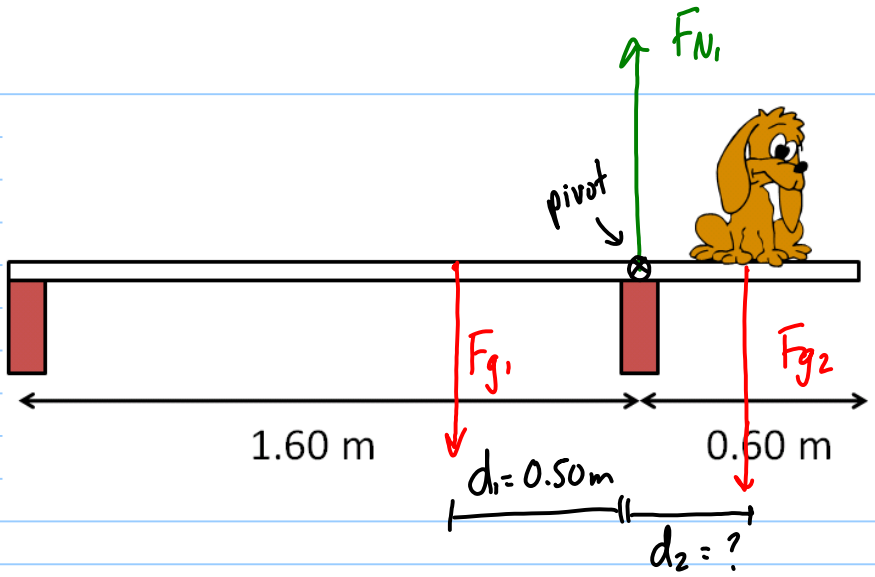
Note Title 06/11/2011

A uniform 2.20 m long 4.0 kg board rests on two bricks as shown below.

a) How far could a 6.0 kg dog walk pas the right hand brick before the board starts to tip upwards?

b) At that exact moment what are the magnitudes of the supporting forces provided by the bricks?





a) $F_{g_1} = m_1 g = (4.0)(9.8) = 39.2\,N$

$F_{g_2} = m_2 g = (6.0)(9.8) = 58.8\,N$

$\tau_{\circlearrowleft} = \tau_{\circlearrowright}$ ✓

$F_{g_1} d_1 = F_{g_2} d_2$ ✓

$$d_2 = \frac{F_{g_1} d_1}{F_{g_2}} = \frac{(39.2)(0.50)}{(58.8)} = \boxed{0.33\,m}$$ ✓

b) Since the board is about to tip $F_{N\,left} = 0$ ✓

$\sum F_y = F_{N\,right} - F_{g_1} - F_{g_2} = 0$

$F_{N\,right} = F_{g_1} + F_{g_2} = \boxed{98\,N}$ ✓