Answer on Question #64418, Physics / Mechanics | Relativity

I used a 7.5 kg wheelbarrow to carry a 35 kg rock. If the rock is placed with its centre of gravity 0.2 m in front of the wheel and the centre of gravity of the wheelbarrow is 0.1 m in front of the wheel what force must be applied to the handle 0.6m from the wheel to keep the wheelbarrow horizontal?

Solution:

$M_1 = m_1 \times g \times d_1 = 7.5\ kg \times 9.8\ m/s^2 \times 0.1\ m = 7.35\ Nm$

$M_2 = m_2 \times g \times d_2 = 35\ kg \times 9.8\ m/s^2 \times 0.2\ m = 68.6\ Nm$

$\sum M = M_1 + M_2 = 7.35\ Nm + 68.6\ Nm = 75.95\ Nm$

The algebraic sum of points is zero or moment of force, rotating it clockwise moment equal force that rotates counterclockwise

$M = Fd = F = M/d = 75.95\ Nm / 0.6\ m = 126.6\ N$

Answer: 126.6 N