P #29

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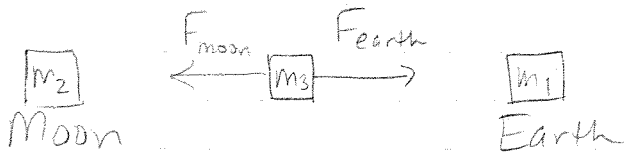
$m_1 = 5.98 \times 10^{24}$ kg (Earth)
$m_2 = 7.36 \times 10^{22}$ kg (Moon)
$m_3 = 3.00 \times 10^{4}$ kg (Spaceship)

$d = (384{,}000 \text{ km}) \div 2 = 192000 \text{ km} = 1.92 \times 10^{8} \text{ m}$



$F_{net} = F_{earth} - F_{moon}$

$= \frac{G \cdot m_1 \cdot m_3}{r^2} - \frac{G \cdot m_2 \cdot m_3}{r^2}$

$= \frac{G \cdot (5.98 \times 10^{24} \text{ kg})(3.00 \times 10^{4} \text{ kg})}{(1.92 \times 10^{8} \text{ m})^2} - \frac{G \cdot (7.36 \times 10^{22} \text{ kg})(3 \times$
$(1.92 \times 10^{8}$ m

$= 325 \text{ N} - 4.0 \text{ N}$

$F_{net} = 321 \text{ N}$ (towards Earth)