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 Along a line from the Earth to the Moon at what distance from Earth's center would an object have to be located so that the gravities cancel each other out? (Lagrangian Point)

$M_E = 5.98 \times 10^{24} \text{ kg}$
 $M_M = 7.35 \times 10^{22} \text{ kg}$
 $R_{\text{Moon}} = 3.84 \times 10^8 \text{ m}$

$F_g = \frac{GM_E}{r^2} = \frac{GM_M}{r^2}$

$\frac{M_E}{r^2} = \frac{M_M}{r^2}$
 $\frac{M_E}{x^2} = \frac{M_M}{(3.84 \times 10^8 - x)^2}$

$\sqrt{\frac{3.84 \times 10^8 - x}{x}} = \sqrt{\frac{M_M}{M_E}}$
 $\frac{3.84 \times 10^8 - x}{x} = 0.111$
 $3.84 \times 10^8 - x = 0.111x$
 $3.84 \times 10^8 = 1.111x$
 $\frac{3.84 \times 10^8}{1.111} = x$
 $3.46 \times 10^8 \text{ m} = x$

$\frac{7.35 \times 10^{22}}{5.98 \times 10^{24}} = 0.111$

CROSS MULT
Solve for x

Nov 21-11:07 AM