

4. We use subscripts s, e, and m for the Sun, Earth and Moon, respectively.

$$\frac{F_{sm}}{F_{em}} = \frac{\frac{Gm_s m_m}{r_{sm}^2}}{\frac{Gm_e m_m}{r_{em}^2}} = \frac{m_s}{m_e} \left( \frac{r_{em}}{r_{sm}} \right)^2$$

Plugging in the numerical values (say, from Appendix C) we find

$$\frac{1.99 \times 10^{30}}{5.98 \times 10^{24}} \left( \frac{3.82 \times 10^8}{1.50 \times 10^{11}} \right)^2 = 2.16 .$$