

Find the magnitude of the gravitational force

a 68.1 kg person would experience while

standing on the surface of Earth with a

mass of  $5.98 \times 10^{24}$  kg and a radius of

$6.37 \times 10^6$  m. The universal gravitational

constant is  $6.673 \times 10^{-11}$  N · m<sup>2</sup>/kg<sup>2</sup>.

Answer in units of N

$$F = G \frac{m_1 m_2}{r^2} - \text{formula for the gravitation force}$$

where

$$m_1 = 68.1 \text{ kg}$$

$$m_2 = 5.98 \times 10^{24} \text{ kg}$$

$$r = 6.37 \times 10^6 \text{ m}$$

$$G = 6.673 \times 10^{-11} \left( \text{N} \times \frac{\text{m}^2}{\text{kg}^2} \right)$$

$$F = 6.673 \times 10^{-11} \frac{68.1 \times 5.98 \times 10^{24}}{(6.37 \times 10^6)^2} = 669.71 \text{ (N)}$$