

The asteroid has a mass 7.395×10^{20} kg and a radius of 539.7 km. what is g on the surface? the value of the universal gravitational constant is $6.67259 \times 10^{-11} \text{ N} \cdot \text{m}^2 / \text{kg}^2$.

Answer in units of m/s^2 .

Solution:

$$F = G \frac{M * m}{R^2}$$

$$F = m * g$$

$$m * g = G \frac{M * m}{R^2}$$

$$g = G \frac{M}{R^2}$$

$$g = 6.67259 \times 10^{-11} \text{ N} \cdot \frac{\text{m}^2}{\text{kg}^2} * \frac{7.395 \times 10^{20} \text{ kg}}{(539700 \text{ m})^2} = 0.1694 \text{ m/s}^2$$