

Answer to Question #67990, Physics / Mechanics

Question:

if the earth doubled in size & the mass is tripled, what would the gravitational field strength be?

Solution:

The strength of the gravitational field of our planet is calculated as

$$g = \frac{Gm_E}{R_E^2}$$

Where G is a gravitational constant, m_E is the mass of Earth, R_E is a radius of our planet.

If the radius is doubled and mass is tripled then

$$g' = \frac{Gm'_E}{R'^2_E} = \frac{G * 3m_E}{(2R_E)^2} = \frac{3}{4} \frac{Gm_E}{R_E^2} = \frac{3}{4} g = 7.3575 \frac{m}{s^2}$$