

Mass/ Weight written questions. See Table P.132

1. Why is g more on the north pole and in the Marianas Trench?
 ea 9.8322 9.8331
 $R_1 < R_2$
 "oblique" R larger
 "spheroid" R smaller
 $F_g = \frac{GMm}{R^2}$ less
 Tides

2. Why is g less at the equator and on Mt. Everest?
9.7805 9.7647
 R larger g smaller

3. What is the evidence that moon pulls on the earth with the same force as the earth pulls on the moon?
 $g = \frac{(6.67 \times 10^{-11}) (5.97 \times 10^{24})}{(6.38 \times 10^6)^2} = 9.8 \text{ m/s}^2$
 $g = \frac{(6.67 \times 10^{-11}) (7.35 \times 10^{22})}{(3.84 \times 10^8)^2} = 2.7 \times 10^{-10} \text{ m/s}^2$
 $F_g = \frac{GMm}{R^2}$ distance between centers
 Universal Law of Gravitation

4) In the ISS in orbit is an astronaut experiencing $g=0$? $g \neq 0 = 9.0795 \text{ m/s}^2$
 why do they appear weightless?
 They are in free fall at the same rate

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