VISUAL PHYSICS ONLINE

Question 1 (P5023)

How could you find the mass of the Earth from its radius and the acceleration due to gravity at the Earth's surface?

Question 2 (P5086)

What is the gravitational force acting a 2000 kg satellite when it is orbiting the Earth at twice the Earth's radius?

Earth's mass $M_E = 5.97 \times 10^{24}$ kg

Earth's radius $R_E = 6.38 \times 10^6$ m

Question 3 (P5117)

A 50 kg person and a 75 kg person are sitting on a bench 500 mm apart. Estimate the gravitational force acting between the two people.

Question 4 (P5188 21 22)

(a) Explain the reason for the selection of infinity as the place of zero gravitational potential energy.

(b) How does this selection of zero level result in any point with a gravitational field having a negative gravitational potential energy value?

Question 5 (P5345)

Find the net force acting on the Moon from the Earth and the Sun if they are at right angles to each other.

$$M_M = 7.35 \times 10^{22} \text{ kg} \qquad M_S = 1.99 \times 10^{30} \text{ kg}$$

$$R_{ME} = 3.84 \times 10^5 \text{ km} \qquad R_{MS} = 1.50 \times 10^8 \text{ km}$$

Answer 1 (A5023)

$$F_G = \frac{G\, m\, M_E}{r_E^{\,2}} = m\, g \implies M_E = \frac{g\, r_E^{\,2}}{G}$$

Answer 2 (A5086)

4900 N

Answer 3 (A5117)

1.0×10^{-6} N

Answer 4 (A5188)

(a) The gravitational force between the objects at infinity is zero.

(b) The zero level at infinity is the maximum level which means that all other values must be negative.

Answer 5 (A5345)

$F = 4.77 \times 10^{20}$ N $\theta = 24.6°$