HW

HOME ASSIGNMENT

(1) How does the force of gravitation change between two objects change when the distance between them is reduced to half?

The force of gravitation between two objects is inversely proportional to the square of the distance between them therefore the gravity will become 4 times if distance between them is reduced to half.

(2) Gravitational force on all objects in proportion to their masses. why then a heavy object does not fall faster than a light object.

The acn in velocity due to gravity is independent of mass of those objects hence a object does not fall faster than a lighter object.

(3) The earth and the moon are attracted to each other by gravitational force. Does the earth attract moon with a force that is greater or smaller or the same as the force with which the moon attracts the earth? why?

They are attracted together by same gravitational force. $F = \frac{GM_1M_2}{d^2}$

d is also same for both.

(4) What happens to the force between two objects, if (i) the mass of one object is doubled. (ii) the distance between the objects is doubled and tripled? (iii) the masses of both objects are doubled?

(i) The force between two objects will be doubled

(ii) the force between two objects will become $\frac{1}{4th}$ and $\frac{1}{9th}$ of the present force.

(iii) The force will become 4 times the present force.

ASSERTION REASON

(1) Statement 1 is true, statement 2 is true and Statement 2 is correct explanation for statement 1.

HOME ASSIGNMENT

(1) The value of the universal gravitational constant

(b) does not change from place to place

(2) The radius of the earth is about 6400km. and that of mars is about 3200km. The mass of earth is 10 times the mass of ~~earth~~ mars.

A object weighs 200N on earth's surface. Then its weight on the surface of Mars will be :-

Ans → $R_e = 6400$ of $R_m = 3200$

$R_e = 2R_m$

If mass of the earth be M_e and that of mars is M_m than $M_e = 10 M_m$

value of g on mars $g_m = \frac{GM_m}{R^2_m}$

earth is $g_e = \frac{GM_e}{R^2_e} = \frac{G \times 10M}{4 \times R^2_m} = 2.5 \frac{GM_m}{R^2_m}$

$= \frac{g_e}{2.5}$

weight on earth is 200N so mass $\frac{200}{g_e}$

Now weight on Mars be mass $\times g_m$

$= \frac{200}{g_e} \times g_m = 200 \times \frac{g_m}{g_e} = \frac{200}{2.5} = 80N$

d) 80N

ASSERTION REASON QUESTION :-

(3) Statement 1 is true, Statement 2 is false.