Two objects of equal mass, m, are separated by a distance d. Answer the following questions:

e) If the mass of both objects was doubled and the distance was doubled, what would happen to the force of attraction?

f) If the mass of both objects was halved and the distance was halved, what would happen to the force of attraction?

g) If the mass of one object was quadrupled, where would a person need to stand such that they felt no net gravitational forces? (in other words, such that the gravitational forces balanced out)

Answer:

According to Newton's law of universal gravitation:

$$F = G\frac{m_1 m_2}{r^2}$$

On task: $F = G\frac{mm}{d^2}$

e) If the mass of both objects was doubled and the distance was doubled the force of attraction will decrease twice.

f) If the mass of both objects was halved and the distance was halved the force of attraction will not changed.

g) If the mass of one object was quadrupled a person need to stand on a distance $\frac{1}{8}d$ from easier object.