Universal Gravitation Introduction:

G=6.67x10-11Nm2/kg2 mEarth=5.98x1024kg rEarth=6.38x106m

1. Find the force of gravitational attraction between a 6.00kg mass and a 287kg mass separated by 1.50m.

2. Find the force of gravitational attraction between a 1695kg mass and a 0.673kg mass separated by 2.99m. Which object feels a stronger force? Assuming no other forces are present find the magnitude of each mass’s acceleration.

3. A 7990kg mass and an 11650kg mass are arranged such that they each experience an attractive force of 1.552x10-3N. What is the distance between the centres of the objects?

4. The force of attraction between the masses shown below is 0.069N. If m1 is 13225kg Find m2.

m1

m1

 48.0cm

5. A 325kg object weighs 995N on the surface of planet Qwxxdfhhipooplimmmstrib (pronounced “Woobly”. It’s a strange language). What is the value of g on Qwxxdfhhipooplimmmstrib’s surface?

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6. A 325kg object weighs 995N on the surface of planet Qrxdfhhipoooplimmstrid (pronounced “Floppy-Hat-Sack”). If Qrxdfhhipoooplimmstrid has a radius of 1.97x106m, find its mass.

7. Find the gravitational field strength 6985km above the surface of Earth.

8. How high above Earth’s surface is the gravitational field strength equal to 3.00N/kg?

9. Planet ₰Ⅎ₴₪‽ᾬᵿ (pronounced “Snotbasket”) has a mass of 9.99x1025kg and a radius of 8.2x106m. Find the gravitational field strength on its surface.

10. Imagine three masses are arranged as shown below:

 m1=2.0kg m2=5.0kg m3=1.8kg

 29cm 62cm

Find the net gravitational force on each mass due to the other two.

**ANSWERS!**

**1. 5.10x10-8N 2. 8.06x10-9N, SAME, a1=4.75x10-12m/s2 a2=1.20x10-8 3. 2.00m 4. 18000kg 5. 3.06N/kg 6. 1.78x1023kg 7. 2.23N/kg 8. 5150km (5.15x106m) 9. 99.1N/kg**

**10. F1=8.2x10-9N Right F2=6.4x10-9N Left F3= 1.85x109 Left**

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