**Law of Universal Gravitation problems**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Date: \_\_\_\_\_\_\_\_\_\_\_\_Period: \_\_\_\_\_\_\_\_\_

**Law of Universal Gravitation**

1) Two students are sitting 1.50m apart. One student has a mass of 70.0 kg and the other has a mass of 52.0 kg. What is the gravitational force between them? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2) What gravitational force does the moon produce on the Earth if their centers are 3.88x108m apart and the moon has a mass of 7.34x1022 kg? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3) If the gravitational force between objects of equal mass is 2.30x10‐8 N when the objects are 10.0m apart, what is the mass of each object? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4) Calculate the gravitational force on a 6.50x102kg that is 4.15x106 m above the surface of the Earth?

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5) The gravitational force between two objects that are 2.1x10‐1 m apart is 3.2x10‐6 N. If the mass of one object is 55 kg what is the mass of the other object? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6) If two objects, each with a mass of 2.0x102 kg, produce a gravitational force between them of 3.7x10‐6 N. What is the distance between them? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

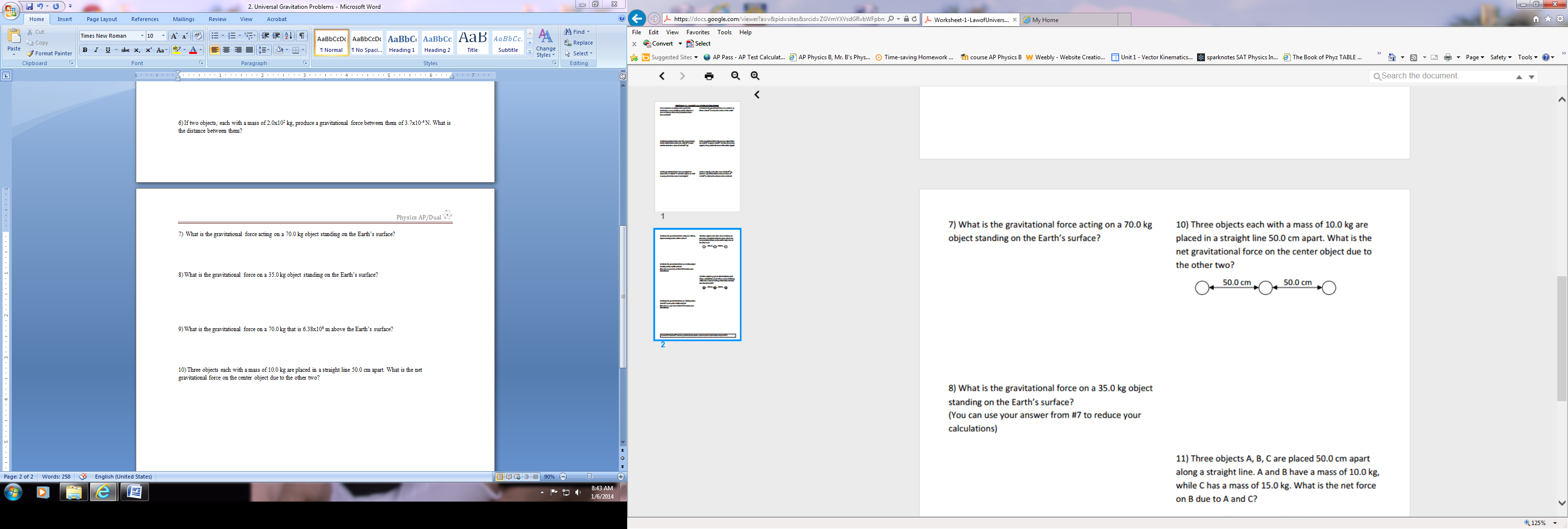
7) What is the gravitational force acting on a 70.0 kg object standing on the Earth’s surface?

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8) What is the gravitational force on a 35.0 kg object standing on the Earth’s surface? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9) What is the gravitational force on a 70.0 kg that is 6.38x106 m above the Earth’s surface?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10) Three objects each with a mass of 10.0 kg are placed in a straight line 50.0 cm apart. What is the net gravitational force on the center object due to the other two? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



11) Three objects A, B, C are placed 50.0 cm apart along a straight line. A and B have a mass of 10.0 kg, while C has a mass of 15.0 kg. What is the net force on B due to A and C? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

