

Name:

Date:

Work each of the following problems. SHOW ALL WORK.

1. The earth remains in orbit around the sun due to the force of gravity. How does the force of gravity exerted by the sun on the earth compare to the force of gravity exerted by the earth on the sun?

2. Two objects exert a gravitational force of 4 N on each other.

a. If the mass of one object is doubled, what will be the new force of gravity between the two objects?

b. If both masses are doubled, what will be the new force of gravity between the objects?

c. If the masses do not change, but the distance between the objects is doubled, what will be the new force of gravity between them?

d. If both the masses and the distance between the objects are doubled, what will be the new force of gravity between them?

3. A 1 kg object sits on the earth's surface. What is the force of gravity between the object and the earth? (mass of the earth = 5.97×10^{24} kg, radius of the earth = 6.37×10^6 m)

questions continued on next page

Unit 3F_Practice Problems

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4. How does your answer to the previous question compare to the force of gravity you would find by multiplying an object's mass by the acceleration due to gravity?

5. If the earth had three times the radius but the same mass, how would this change the weight of the object?

6. If a 3 kg object is falling at terminal velocity, what upward force of air resistance does it experience?

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7. A 2 kg falling object experiences 5 N of air resistance. What is the acceleration of this object?