Ch 7: Gravity name:

Format: 22 multiple choice; 1 short answer; 2 calculations; 5 bonus; 80 pts. 🡪 percentage

Study Guide

**Vocab**

*Big Bang neap tide tangential v*

*Dark matter spring tide universal constant of gravitation, G*

*law of universal gravitation*

**Formulae**; (units)

F = Gm1m2/d2 (when calculating Fg between two objects & G is important)

F ~ 1/d2 (when calculating Fg between two objects; F & d are given; d changes)

F ~ m1m2/d2 (when calculating Fg between two objects ; masses and d change)

**Things you MUST know:**

1. Be familiar with the likely story/explanation behind Newton & the apple.
2. According to Newton (&, incidentally, reality), the greater the masses of two objects, the greater the Fg between them; also, the greater the d between them, the lesser the Fg. (See first formula…do you see it? There is a direct relationship between Fg and mass and an inverse square relationship between Fg and d.
3. Fg for most objects we talk about is measured at the earth's surface, therefore it can also be called your weight; typically measured in N.
4. Be able to 'calculate' Fg between two objects in varying mass & distance change scenarios (cf. pp. 8 & 9 in the notes).
5. We know from experience that certain objects (ie. Rockets) are capable of escaping the Earth's gravitational pull such that they can orbit or even travel to other celestial bodies. A deeper question is, can they utterly escape the Earth's gravitational pull even if the Earth cannot cause them to fall back to its surface? (Use the third formula above, inserting a progressively larger & larger d. What's the trend? What does this prove?)
6. Remember the distances that diminish the Earth's Fg in any significant way are the Earth's radius long! (see drawing on p. 5 in the notes)
7. If the sun pulls on the Earth with a greater F than the moon, why is it that the moon is more responsible for the Earth's tides?
8. Suppose you set a watermelon on your head. Which would produce a greater tidal effect on your body--the moon or the melon? Why? (And, no, it is not because the moon doesn't make you hungry)
9. Tidal forces result from unequal forces acting on different parts of a body. (you can quote me)
10. Be not only familiar with both types of tides, but also the Sun, Earth, Moon alignment responsible for each.
11. What phases of the moon correspond with spring tides? Which phase of the moon corresponds with neap tides?
12. There are no tides in a community swimming pool. There are no significant tides in the human body? Why?
13. The timing of the tides (eg. 2 high & 2 low per day) has more to do with the rotation of the earth than anything else.
14. ESSAY: Mathematically support a verbal explanation of the following circumstance:
15. CALCULATIONS: Be able to find the gravitational F between two objects, persons ( or llamas) given all but the actual answer.
16. Enjoy a few bonuses.

