

Name: _____

**AP Physics 1: Uniform Circular Motion
Universal Gravitation HW**

Conceptual Questions:

1. If the Earth's mass were to double, in what ways would the Moon's orbit be different? Why?
2. Which pulls harder gravitationally – the Earth on the Moon or the Moon on the Earth? Why?
3. Is the centripetal acceleration of Mars in its orbit around the Sun larger or smaller than the centripetal acceleration of the Earth? Justify your answer.

Mathematical Questions:

*Consider relative size and distances when consider when to treat a value as a point source or not.

Helpful constants:

Mass of Earth = 5.97×10^{24} kg

Radius of the Earth = 6.371×10^6 m

Distance between the

Earth and Moon = 3.84×10^8 m

4. A hypothetical planet has a radius 1.5 times that of Earth, but has the same mass. What is the acceleration due to gravity near its surface?
5. A hypothetical planet has a mass 1.66 times that of Earth, but the same radius. What is the acceleration due to gravity near its surface?

