Higher Order Universal Gravity Questions

1. An astronaut travels to a strange new planet. She is trying to determine some of the properties of this planet. She brought with her a scale from Earth that is calibrated to Earth's gravitational field. On Earth, the mass of her and her suit is a total of 100kg. On the new planet, the scale read a mass of 75kg. Determine what must be the gravitational field strength on the new planet.

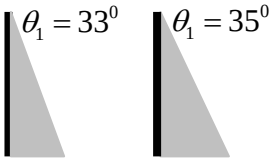
2. If the planet has a radius that is 2/3 that of Earth's, what is the planet's mass?

3. The Dream Crusher!

   This astronaut now travels to a new planet. On this planet she does some further tests. The first test was to determine the acceleration due to gravity. During this test, she drops a stone from a height of 2.00m. The average fall time for the stone was 0.755929 s.

   a) Determine the acceleration due to gravity.

   Her next test was to determine the mass of the planet. The first step was to determine the radius of the planet. She did this by placing a spike in the ground and measuring the angle of the shadow at noon. She then traveled 157.08 km north a performed the same experiment. Here are the results



   b) Determine the radius and the mass of the planet.