11 Physics Worksheet
Gravitation and Satellites

1. Explain how the gravitational force of attraction shows Newton's third law

2.
   (a) Calculate the gravitational force of a planet of mass 4.5×10^9 kg on a moon of mass 2.2×10^8 kg, if the distance between their centres is 6.8×10^7 m.
   (b) State the force of the moon on the planet.
   (c) Calculate the acceleration of the planet
   (d) Calculate the acceleration of the moon

3. If a planet and a moon both experience the same force, explain why the moon's acceleration is noticeable while the planet's is not.

4. Calculate the acceleration due to gravity on the surface of the planet in question 2, given that it has a radius of 9.0×10^4m.

5. Explain why two objects of different mass dropped the same distance from the surface of a planet will experience the same acceleration even though the heavier object experiences more force.

6.
   (a) The moon in question 2 is a satellite orbiting the planet in question 2. Calculate the speed of the moon.
   (b) Calculate the period of motion of the moon.
   (c) Hence state how long it will take to do 5 orbits of the planet.

7. Explain why the orbits shown below are not possible for satellites.
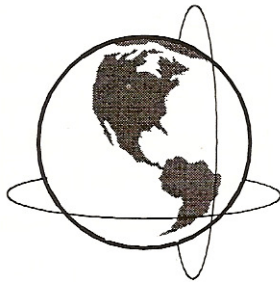
8.
   (a) Explain the difference between a geostationary satellite and a polar satellite.
   (b) Explain why Google Earth uses images taken by polar satellites and not geostationary satellites.