**Assignments: Gravitational Fields**

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1. **The gravitational field strength of an unknown planet is 22 N/kg on its surface. Calculate the value of *g* if the planet's mass and radius were both doubled. (5 marks)**

* We are given the field strength of the surface.

Now, when as given in the question above, we can rewrite as the following.

Thus, the answer would be .

1. **Calculate the period of a planet in the sun system if its radius of orbit around the sun is 7.871011 m. Use k = 3.3551018 m3/s2. (5 marks)**

* Given that the .
* We can write ‘Time period’,

Thus, the answer would be

1. **How much additional energy is needed to fire a 7.8102 kg weather monitor on the Earth’s surface to a height of 190 km above the Earth? Assume that the weather monitor rises to that height, stops, and falls back to Earth.**

* We can think of extra energy, , as a change in potential energy, which is the difference with the total energy at height h in addition to the radius of earth and the total energy at the surface of the earth.

Thus, the answer would be .

1. **A 1400 kg satellite is in orbit around the earth at an altitude of 3900 km. Calculate its total energy. (5 marks)**

* Given that the height h is 3900km, we can write the total energy of the satellite.

Thus, the answer would be .