## PhyzJob: Field Calculations



1. a. Calculate the strength of the earth's gravitational field at the surface of the earth. (The earth's mass is  $5.98 \times 10^{24}$  kg and the earth's radius is  $6.37 \times 10^6$  m.)

b. What is the force acting on a 10 kg mass at this point?

2. a. Do you recognize the number from your answer in 1. a? What did we previously call this number?

b. Are the units m/s² equivalent to N/kg? Which units (m/s² or N/kg) are better suited to describe gravitational field strength (force per unit mass)?

3. Acceleration due to gravity at the surface of the moon is 1.6 m/s<sup>2</sup>. What is the strength of the gravitational field at the surface of the moon?

1a. 9.83 N/kg b.98.3 N 3.1.6 N/kg 4a.120 kN/C b. 12 mN 5.30 kN/C 6.630 kN/
6. Two cookie sheets (flat metal plates) are given opposite charges. The left plate has a charge of +5 $\mu$ C and the right plate has a charge of -5 $\mu$ C. Each plate has an area of 0.90 m <sup>2</sup> (for a <i>total</i> of 1.8 m <sup>2</sup> ) and the plates are separated by a distance of 0.02 m. What is the electric field strength between the plates?
5. Without using your calculator, can you determine the strength of the field at 0.60 m from the same charge (from 4) You <i>should</i> be able to do this! (Use your calculator to check your estimate.)
b. What is the force on a 0.1 $\mu$ C test charge at this point (0.30 m from the generator)?
4. a. What is the electric field strength 0.30 m away from a Van de Graaff generator with a charge of 1.2 $\mu$ C?