6 **(a)** By reference to electric field lines, explain why, for points outside an isolated spherical conductor, the charge on the sphere may be considered to act as a point charge at its centre.

.....

.....

.....

..... [2]

(b) Two isolated protons are separated in a vacuum by a distance x.

(i) Calculate the ratio

$$\frac{\text{electric force between the two protons}}{\text{gravitational force between the two protons}}.$$

ratio = ... [3]

(ii) By reference to your answer in **(i)**, suggest why gravitational forces are not considered when calculating the force between charged particles.

.....

..... [1]

[Total: 6]