Answer **all** the questions in the spaces provided.

1 (a) (i) State what is meant by a line of force in a gravitational field.

.....

.....

.....[1]

(ii) By reference to the pattern of the lines of gravitational force near to the surface of the Earth, explain why the acceleration of free fall near to the Earth's surface is approximately constant.

.....

.....

.....

.....

.....[3]

(b) The Moon may be considered to be a uniform sphere that is isolated in space. It has radius 1.74×10^3 km and mass 7.35×10^{22} kg.

(i) Calculate the gravitational field strength at the Moon's surface.

gravitational field strength = ... N kg^{-1} [2]

(ii) A satellite is in a circular orbit about the Moon at a height of 320 km above its surface.

Calculate the time for the satellite to complete one orbit of the Moon.

time = ... s [3]

[Total: 9]