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

1 (a) (i) A gravitational field may be represented by lines of gravitational force.
State what is meant by a *line of gravitational force*.

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.....

.....[1]

(ii) By reference to lines of gravitational force near to the surface of the Earth, explain why the gravitational field strength *g* close to the Earth's surface is approximately constant.

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.....[3]

(b) The Moon may be considered to be a uniform sphere of diameter 3.4×10^3 km and mass 7.4×10^{22} kg. The Moon has no atmosphere.

During a collision of the Moon with a meteorite, a rock is thrown vertically up from the surface of the Moon with a speed of $2.8\,\text{km}\,\text{s}^{-1}$.

Assuming that the Moon is isolated in space, determine whether the rock will travel out into distant space or return to the Moon's surface.

[4]

[Total: 8]