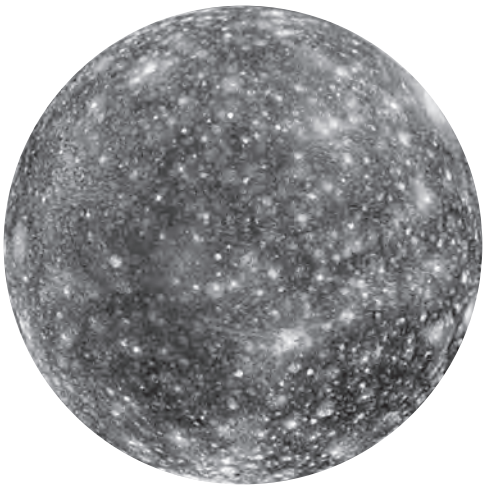
**8** The photograph shows Callisto, a moon of the planet Jupiter.



(Source: © Elena11/Shutterstock)

(a) In the space below, draw a labelled diagram to show how Callisto orbits Jupiter.

**(2)**

(b) Callisto orbits Jupiter at an orbital radius of 1 880 000 km and with an orbital period of 400 hours.

Calculate the orbital speed of Callisto in km/s.

Give your answer to 3 significant figures.

**(4)**

orbital speed = ..... km/s

(c) Callisto has a gravitational field strength of 1.2 N/kg at its surface.

The Earth's moon has a gravitational field strength of 1.6 N/kg at its surface.

(i) Callisto has a larger mass than the Earth's moon.

Suggest why Callisto has a lower gravitational field strength than the Earth's moon.

**(1)**

.....

.....

.....

(ii) An object has a weight of 59 N on the surface of the Earth's moon.

Calculate the weight of the same object if it were on the surface of Callisto.

**(3)**

weight = ..... N

**(Total for Question 8 = 10 marks)**