3 A space probe that has a mass of 600 kg is on the planet Mars.

The acceleration of free fall on Mars is $4.0\,m/s^2$.

What is the weight of the space probe on Mars?

A 60 N **B** 150 N **C** 2400 N **D** 6000 N

4 Which measuring instrument is used to compare masses?

A balance

B protractor

C stop-watch

D voltmeter

2 Table 2.1 contains information about the planet Mars.

Table 2.1

mass	6.4×10^{23} kg
gravitational field strength at surface	3.7 N / kg
average density	3900 kg / m^3

(a) Define gravitational field strength.

.....

..... [1]

(b) **(i)** An object has a weight of 42 N at the surface of the Earth.

Calculate the weight of the object at the surface of Mars.

weight = ... [2]

(ii) Calculate the volume of Mars.

volume = ... [2]

(c) Fig. 2.1 shows a space buggy that is tested on Earth. The buggy is travelling at a constant speed in a straight line. The driving force on the buggy is 30 N.

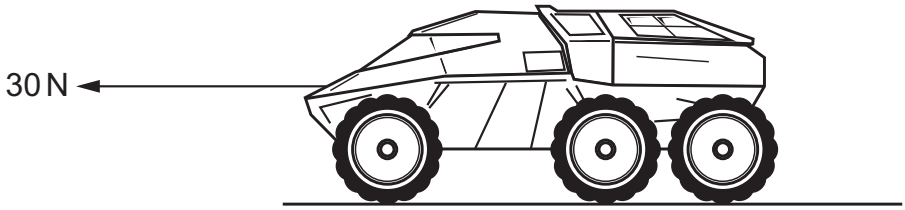


Fig. 2.1

(i) Draw and label **one** arrow on Fig. 2.1 to show the size and direction of the resistive forces on the buggy. [2]

(ii) Air resistance on Mars is less than air resistance on Earth.
The same driving force, 30 N, is exerted on the buggy on Mars.

1. State the effect this has on the resultant force on the buggy on Mars.

.....

2. State the relationship between resistive forces, driving force and resultant force.

.....
[1]

[Total: 8]

2 Which name is given to the quantity of matter in an object?

A density

B mass

C volume

D weight

3 A body is moved from place X to place Y where the gravitational field strength is different.

What happens to its mass and to its weight due to the move?

	mass	weight
A	changes	changes
B	changes	stays the same
C	stays the same	changes
D	stays the same	stays the same

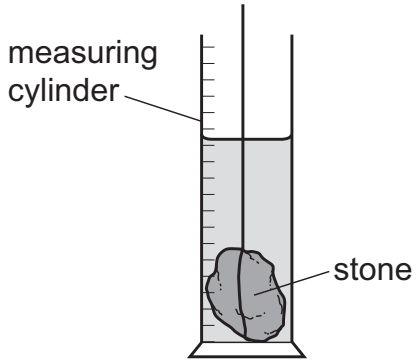
4 On the Earth, a spring stretches by 5.0 cm when a mass of 3.0 kg is suspended from one end.

The gravitational field strength on the Moon is $\frac{1}{6}$ of that on the Earth.

Which mass, on the Moon, would stretch the spring by the same extension?

A 0.50 kg **B** 3.0 kg **C** 5.0 kg **D** 18 kg

6 A student determines the density of an irregularly shaped stone. The stone is slowly lowered into a measuring cylinder partly filled with water.



Which other apparatus does the student need to calculate the density of the irregularly shaped stone?

A a balance

B a thermometer

C a metre rule

D a stop-watch