1   Draw a line from each quantity on the left-hand side to the correct unit on the right-hand side. One
    quantity (weight) has already been matched to its unit.

| density |
| pressure |
| power |
| weight |

| $kg\,m\,s^{-2}$ |
| $kg\,m^2\,s^{-3}$ |
| $kg\,m^{-3}$ |
| $kg\,m^{-1}\,s^{-2}$ |

(weight — $kg\,m\,s^{-2}$)
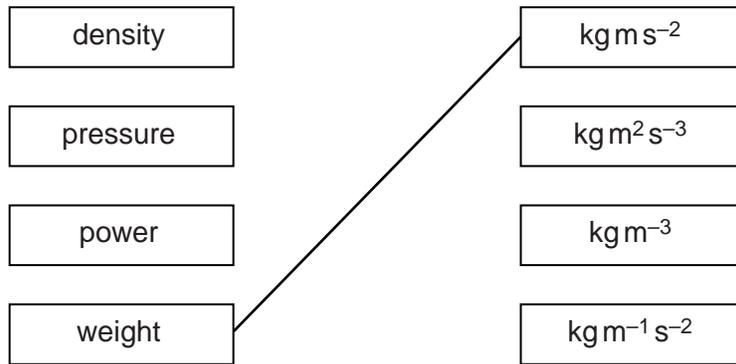
[2]

[Total: 2]

2 **(a)** State **one** difference between a scalar quantity and a vector quantity.

....

.... **[1]**

(b) Fig. 1.1 shows two sets of quantities listed as 'scalars' and 'vectors' by a student.

| acceleration |
| pressure |
| stress |
| time |
| volume |

scalars

| displacement |
| energy |
| power |
| velocity |
| weight |
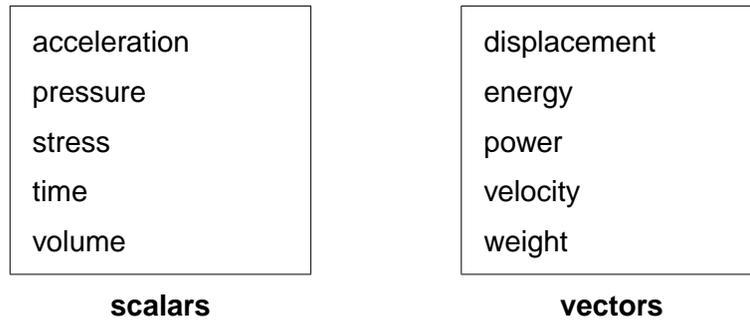
vectors

Fig. 1.1

(i) State the one quantity that has been incorrectly listed as a scalar.

.... **[1]**

(ii) State two quantities that have been incorrectly listed as vectors.

1. ....

2. .... **[1]**

(iii) State two quantities listed as scalars that have the same unit. Name this unit.

1. ....

2. ....

unit: .... **[2]**

(c) Circle the correct value for the prefix tera (T) in the list below.

10^6 10^9 10^{12} 10^{15} **[1]**

(d) Rearrange the following prefixes in the order of smallest to largest.

μ   c   p   k

.... **[1]**

[Total: 7]

3 **(a)** Draw a straight line from each quantity on the left hand side to its correct unit on the right hand side; one has already been done for you.

velocity		Nm^{-2}
work done		ms^{-1}
stress		Nm
density		kgm^{-3}
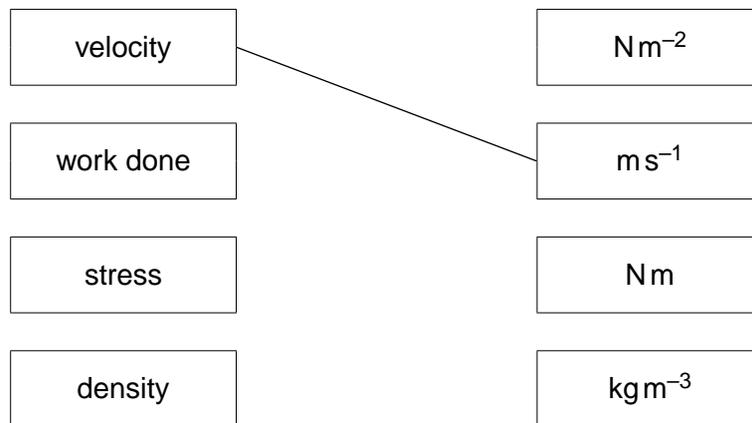
[2]

(b) Fig. 1.1 shows a metal cube which rests on a table.

cube of mass 4.8 kg
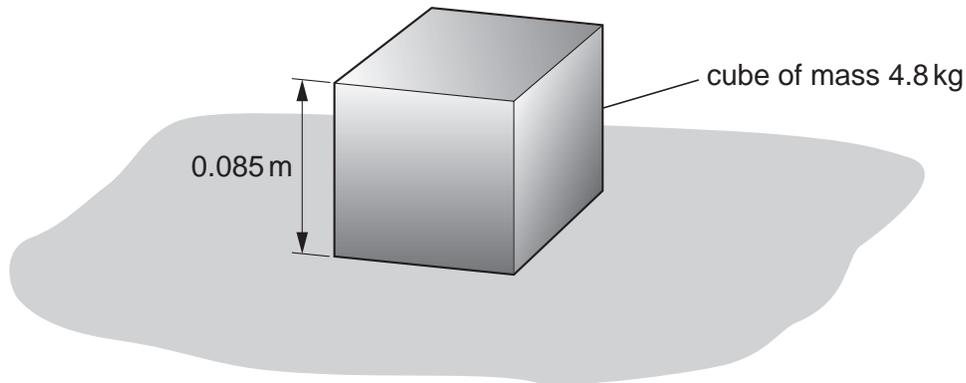
0.085 m

Fig. 1.1

The mass of the metal cube is 4.8 kg. Each side of the cube has length 0.085 m. The cube exerts pressure on the table.

(i) Complete the sentence below:

The force acting on the table is due to the ………………………… of the metal cube.   **[1]**

(ii) Calculate the pressure exerted on the table by the metal cube.

pressure = ... Pa **[2]**

(iii) The metal cube shown is replaced by a second cube made of the same material but with each side of double the length of the original cube.

Complete the sentences below for the second cube when compared with the original cube.

The mass of the second cube is …………………… times greater than the original cube.

The cross-sectional area of the base is …………………… times greater than the original cube.

Hence, the pressure exerted by this cube is …………………… times greater than the original cube.

[3]

[Total: 8]

4 **(a)** A student writes four incorrect statements shown in the table below. The error in each statement is circled. Write the correct answer for the circled unit or number; one has already been done for you.

Incorrect statement	Correct unit or number
The weight of a person is about 700 (kg)	N
The atmosphere exerts a pressure of about 1.0×10^5 (N.m²).	
A force of 1 N may be written as 1 kg (m⁻¹s⁻¹) .	
1 GW is (10) times bigger than 1 MW.	

[2]

(b) Fig. 1.1 shows the apparatus used to determine the density of glass.
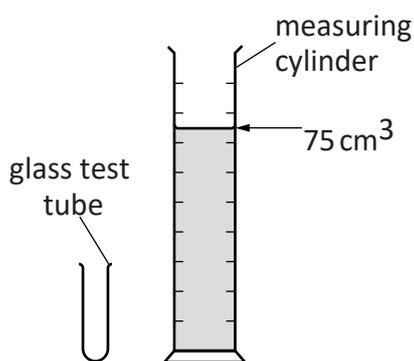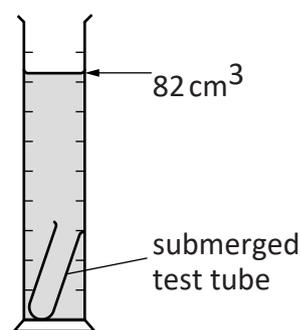

**Fig. 1.1**   **Fig. 1.2**

The glass test tube has mass 1.6×10^{-2} kg. The measuring cylinder is partly filled with water. The test tube is gently pushed into the water until it is fully submerged as shown in Fig. 1.2. The level of the water inside the measuring cylinder increases from 75 cm³ to 82 cm³.

Calculate the density of the test tube glass in $kg\,m^{-3}$.

density = ... $kg\,m^{-3}$ [2]

[Total: 4]