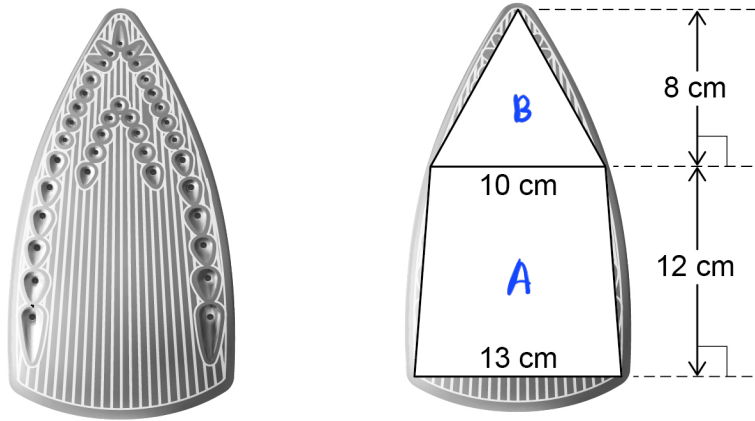


1

Ralf has an iron.

He models the base as a triangle joined to a trapezium.

Not drawn accurately



- 1 (a) The iron applies a force of 25 newtons (N)

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Work out the pressure using Ralf's model.

[4 marks]

$$\text{Area of A} : \frac{1}{2} \times (13 + 10) \times 12 = 138 \quad (1)$$

$$\text{Area of B} : \frac{1}{2} \times 10 \times 8 = 40 \quad (1)$$

$$\text{Total area} : 138 + 40 = 178 \quad (1)$$

$$\text{pressure} = \frac{25}{178} = 0.140 \quad (1)$$

Answer 0.14 N/cm²

- 1 (b) Is the actual pressure greater than, equal to or less than your answer to part (a)?

Tick **one** box.

☐

greater than

☐

equal to

☒

less than

①

Give a reason for your answer.

[2 marks]

The actual area is bigger. ①

2

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

The mass is divided by 2 and the volume is multiplied by 4

What happens to the density?

Circle your answer.

[1 mark]

$\times 2$

$\div 2$

$\times 8$

$\div 8$

1

- 3 Which **one** of these is a unit of density?
Circle your answer.

[1 mark]

cm^2/g

cm^3/g

g/cm^2

g/cm^3



$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

- 4 Two objects, J and K, are applying pressure to areas of ground.

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

For J, the force is 18.9 newtons and the area is 0.45m^2

$$\text{pressure for J : pressure for K} = 7 : 8$$

$$\text{area for J : area for K} = 9 : 5$$

Work out the force for K.

[4 marks]

$$\text{pressure of J : } \frac{18.9}{0.45} = 42 \quad (1)$$

$$\text{pressure of K : } \frac{42}{7} \times 8 = 48 \quad (1)$$

$$\text{Area of K : } \frac{0.45}{9} \times 5 = 0.25 \quad (1)$$

$$\text{Force of K : } 48 \times 0.25$$

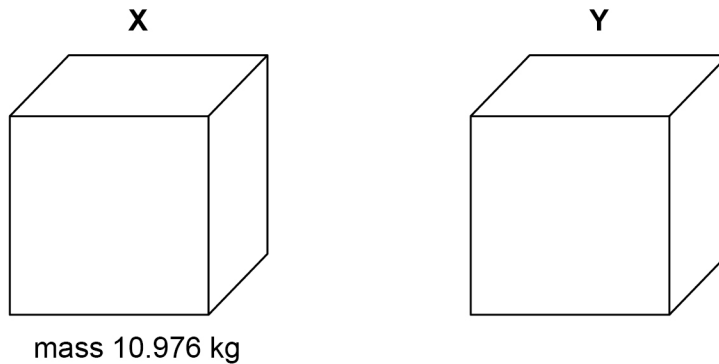
$$= 12 \quad (1)$$

Answer 12 newtons

5 Here are two solid cubes, X and Y.

The mass of X is 10.976 kg

The area of **each face** of X is 784 cm^2



mass 10.976 kg

5 (a) Zayan wants to know the density of Y.

He assumes that Y is identical to X.

What density should he get for Y?

Give your answer in **grams per cubic centimetre**.

[4 marks]

$$\text{length of one side} = \sqrt{784}$$

$$= 28 \quad (1)$$

$$\text{volume of X} = 28^3 = 21952 \text{ cm}^3 \quad (1)$$

$$\text{mass of X} = 10.976 \times 1000 = 10976 \text{ g}$$

$$\text{density} = \frac{10976}{21952} = 0.5 \text{ g cm}^{-3} \quad (1) \quad (1)$$

Answer 0.5 g/cm³

5 (b)

In fact,

the mass of Y is less than the mass of X

the area of each face of Y is greater than the area of each face of X.

What does this mean about the actual density of Y?

Tick **one** box.**[1 mark]**☒

It is less than the answer to part (a)

☐

It is equal to the answer to part (a)

☐

It is greater than the answer to part (a)

☐

It is not possible to tell