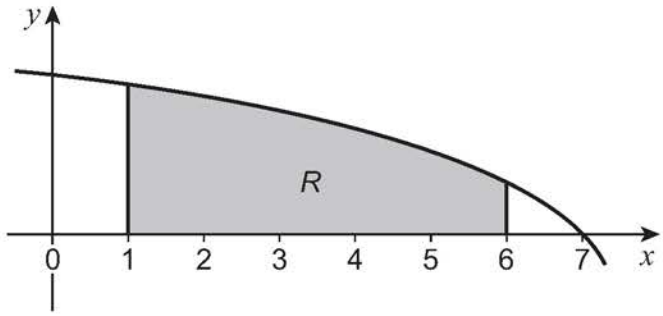
**11** The region $R$ enclosed by the lines $x = 1$, $x = 6$, $y = 0$ and the curve

$$y = \ln(8 - x)$$

is shown shaded in **Figure 3** below.

**Figure 3**



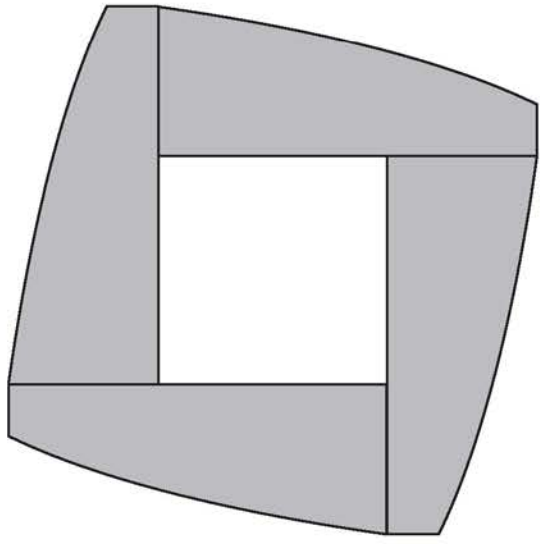

All distances are measured in centimetres.

**11 (a)** Use a single trapezium to find an approximate value of the area of the shaded region, giving your answer in $cm^2$ to two decimal places.

**[2 marks]**

**11 (b)** Shape $B$ is made from four copies of region $R$ as shown in **Figure 4** below.

**Figure 4**



Shape $B$ is cut from metal of thickness 2 mm

The metal has a density of $10.5\,g/cm^3$

Use the trapezium rule with **six** ordinates to calculate an approximate value of the mass of Shape $B$.

Give your answer to the nearest gram.

**[5 marks]**

**11 (c)** Without further calculation, give one reason why the mass found in part **(b)** may be:

**11 (c) (i)** an underestimate.

**[1 mark]**

**11 (c) (ii)** an overestimate.

**[1 mark]**