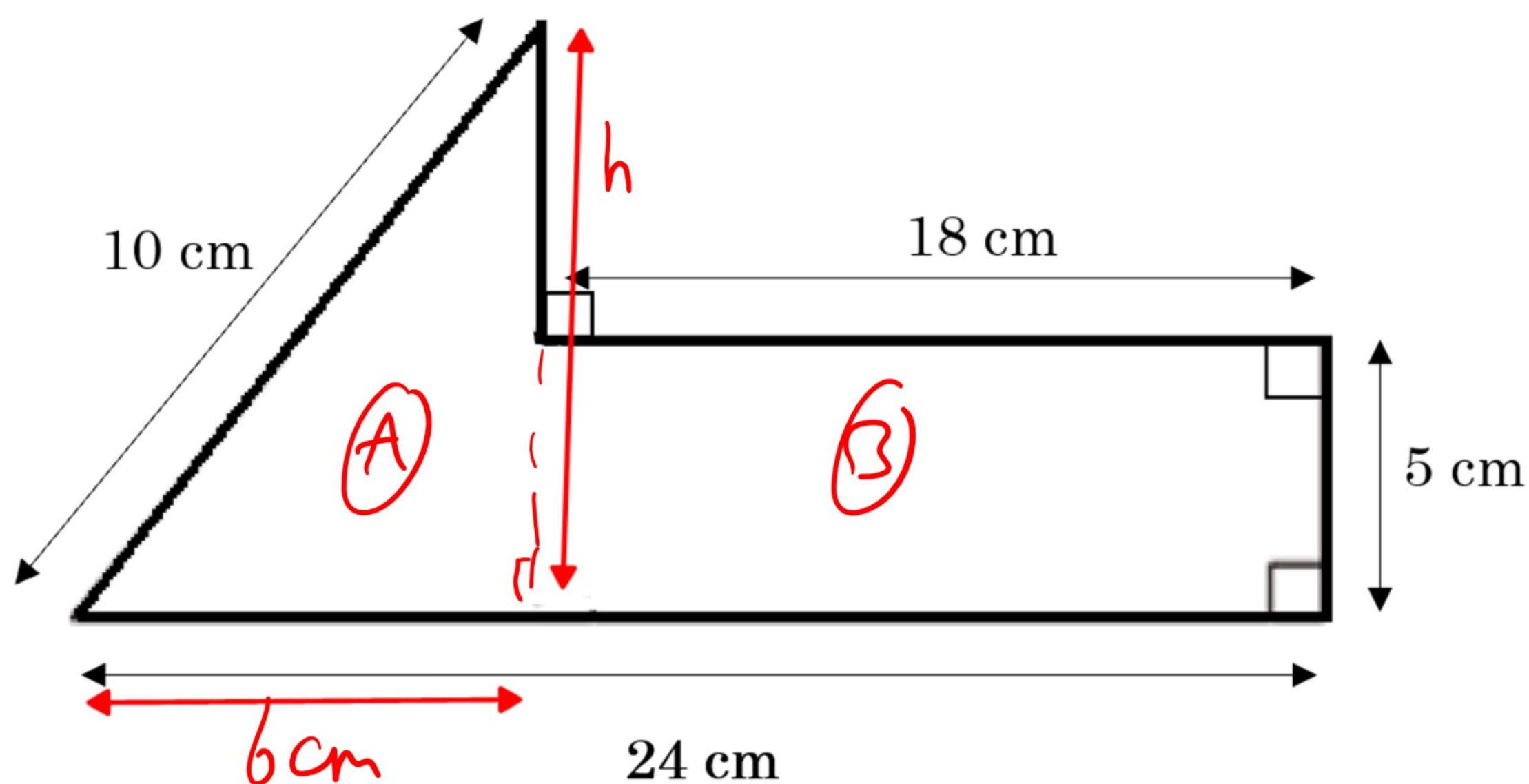




Areas of Compound Shapes Exam Practice

Q1. Work out the area of the shape below, stating the correct units:



$$\text{Area A: } \frac{1}{2} \times 6 \times h$$

where by Pythagoras' Theorem,

$$6^2 + h^2 = 10^2$$

$$\Rightarrow 36 + h^2 = 100$$

$$h^2 = 64$$

$$h = 8$$

$$\Rightarrow \text{Area A} = 24 \text{ cm}^2$$

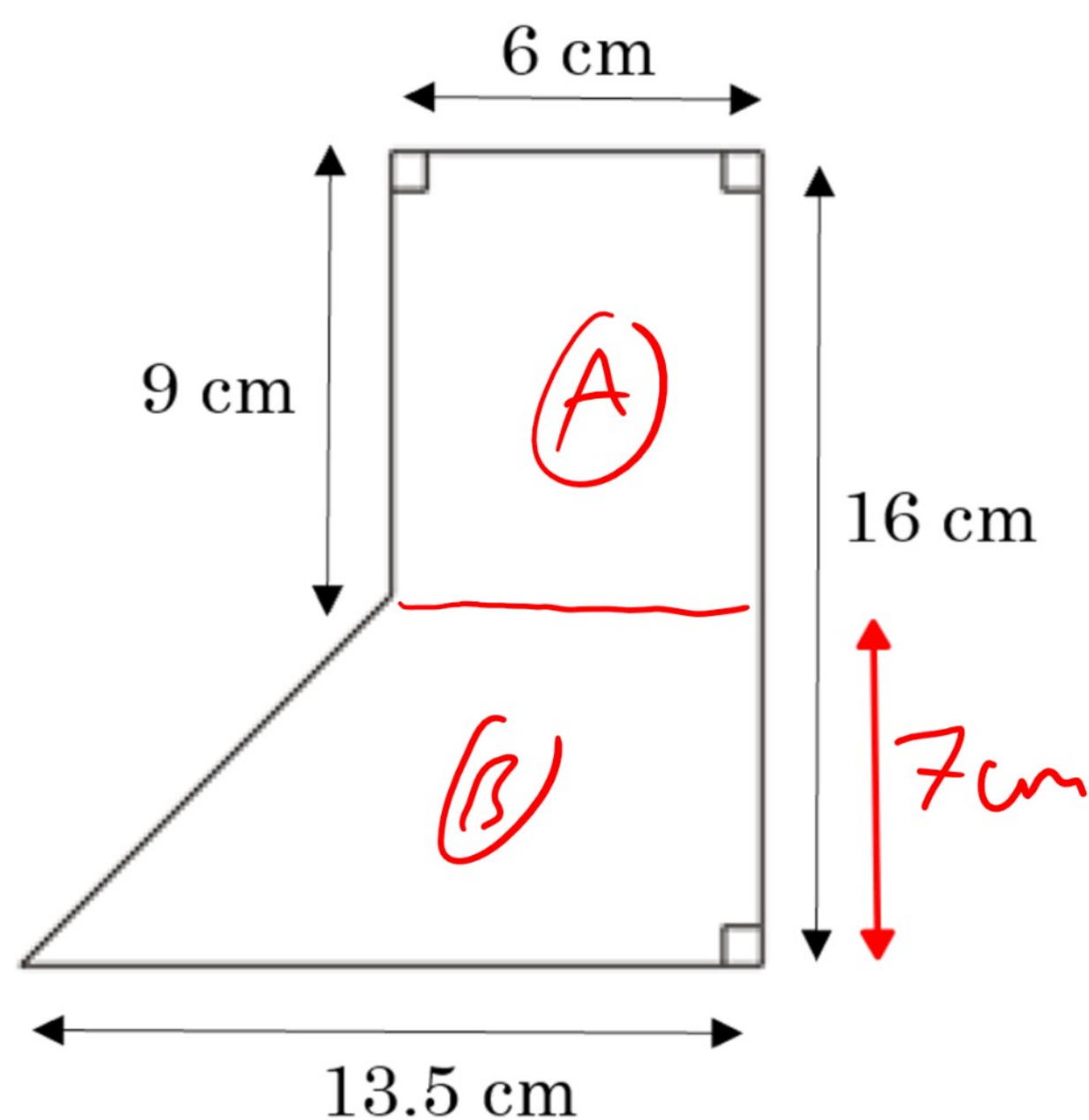
$$\text{Area B: } 18 \times 5 = 90 \text{ cm}^2$$

$$\begin{aligned} \text{Total} &= 24 + 90 \\ &= 114 \text{ cm}^2 \end{aligned}$$

Answer: 114 cm²
(4 marks)



Q2. Work out the area of the shape below, stating the correct units.



$$\begin{aligned} \cdot \text{Area A} &= 6 \times 9 \\ &= 54 \text{ cm}^2 \end{aligned}$$

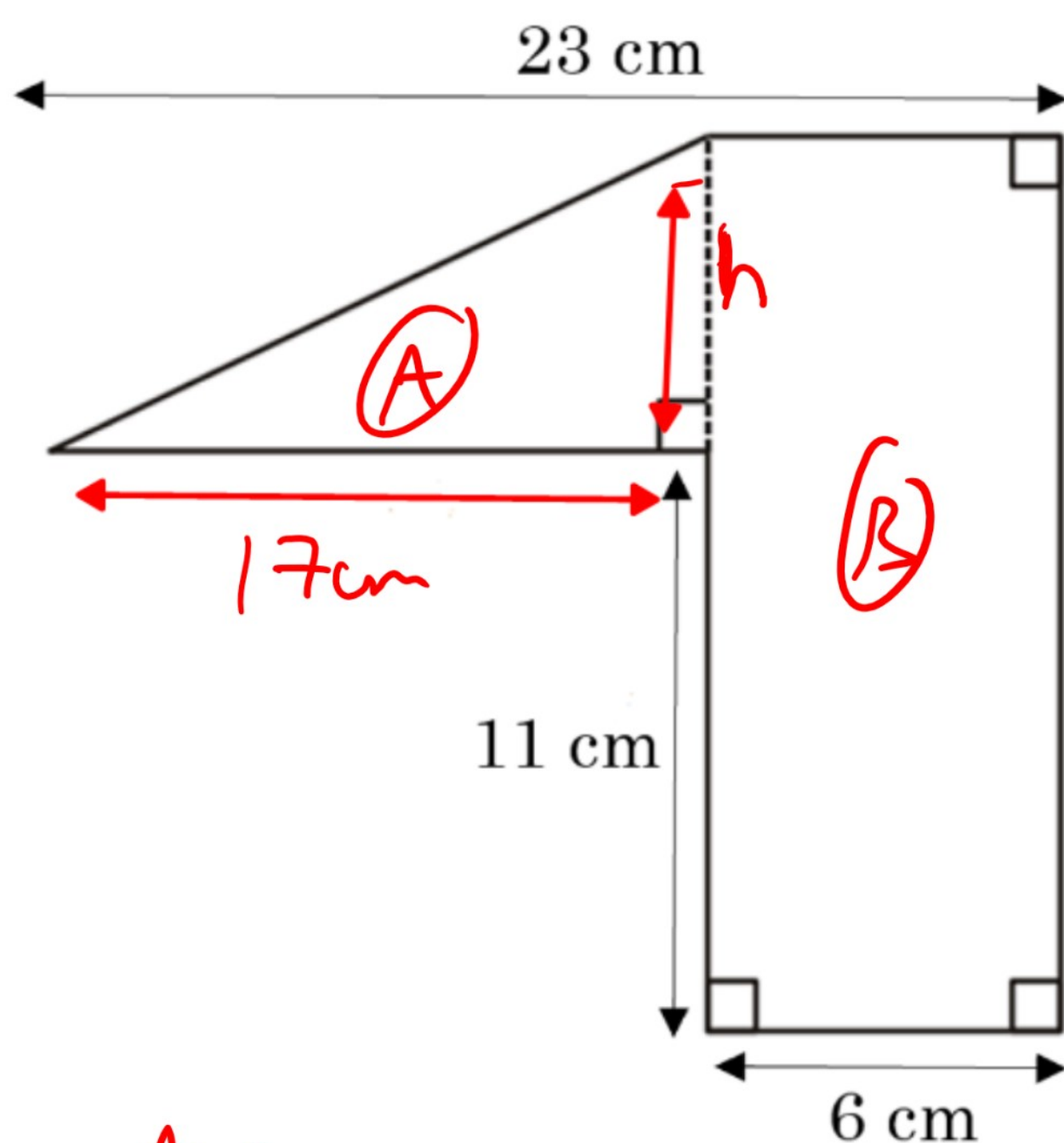
$$\begin{aligned} \cdot \text{Area B} &= \frac{1}{2} \times h \times (a+b) \text{ (Trapezium)} \\ &= \frac{1}{2} \times 7 \times (6+13.5) \\ &= 68.25 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \cdot \text{Total} &= 54 + 68.25 \\ &= 122.25 \text{ cm}^2 \end{aligned}$$

Answer: 122.25 cm²
(3 marks)



Q3. The area of the triangle is 68 cm^2 . Work out the area of the entire 6-sided shape.



• from A :

$$\frac{1}{2} \times 17 \times h = 68$$

$$\Rightarrow 17h = 136$$

$$h = 8$$

$$\begin{aligned} \Rightarrow \text{area B} &= (11 + 8) \times 6 \\ &= 19 \times 6 \\ &= 114 \text{ cm}^2 \end{aligned}$$

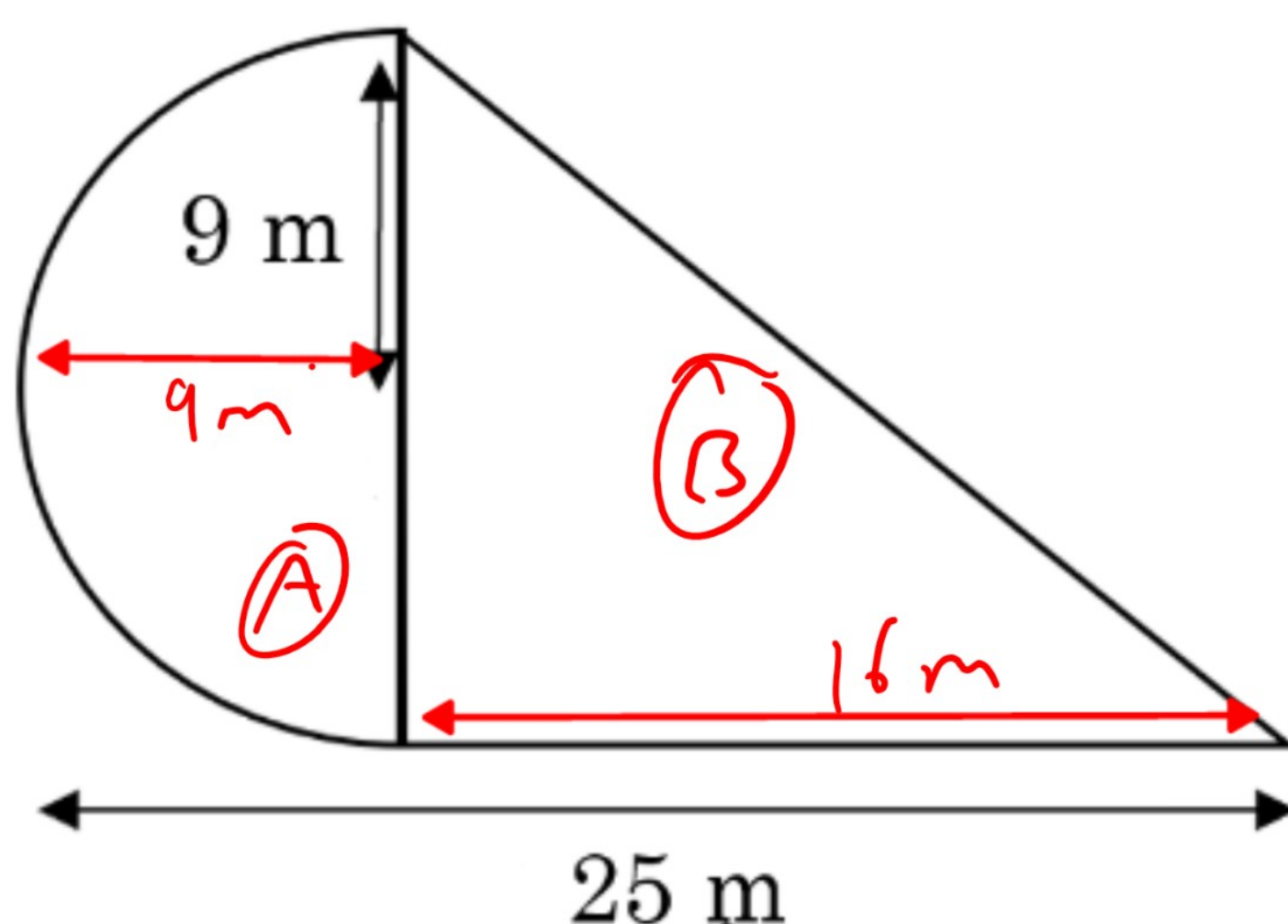
$$\begin{aligned} \cdot \text{Total} &= 68 + 114 \\ &= 182 \text{ cm}^2 \end{aligned}$$

Answer: 182 cm²

(4 marks)



Q4. Find the shaded area of this shape, stating the correct units.



$$\begin{aligned} \text{Area A} &= \frac{1}{2} \pi 9^2 \quad \left(\frac{1}{2} \text{ of } \pi r^2 \right) \\ &= \frac{81}{2} \pi \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Area B} &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 16 \times 18 \\ &= 144 \text{ m}^2 \end{aligned}$$

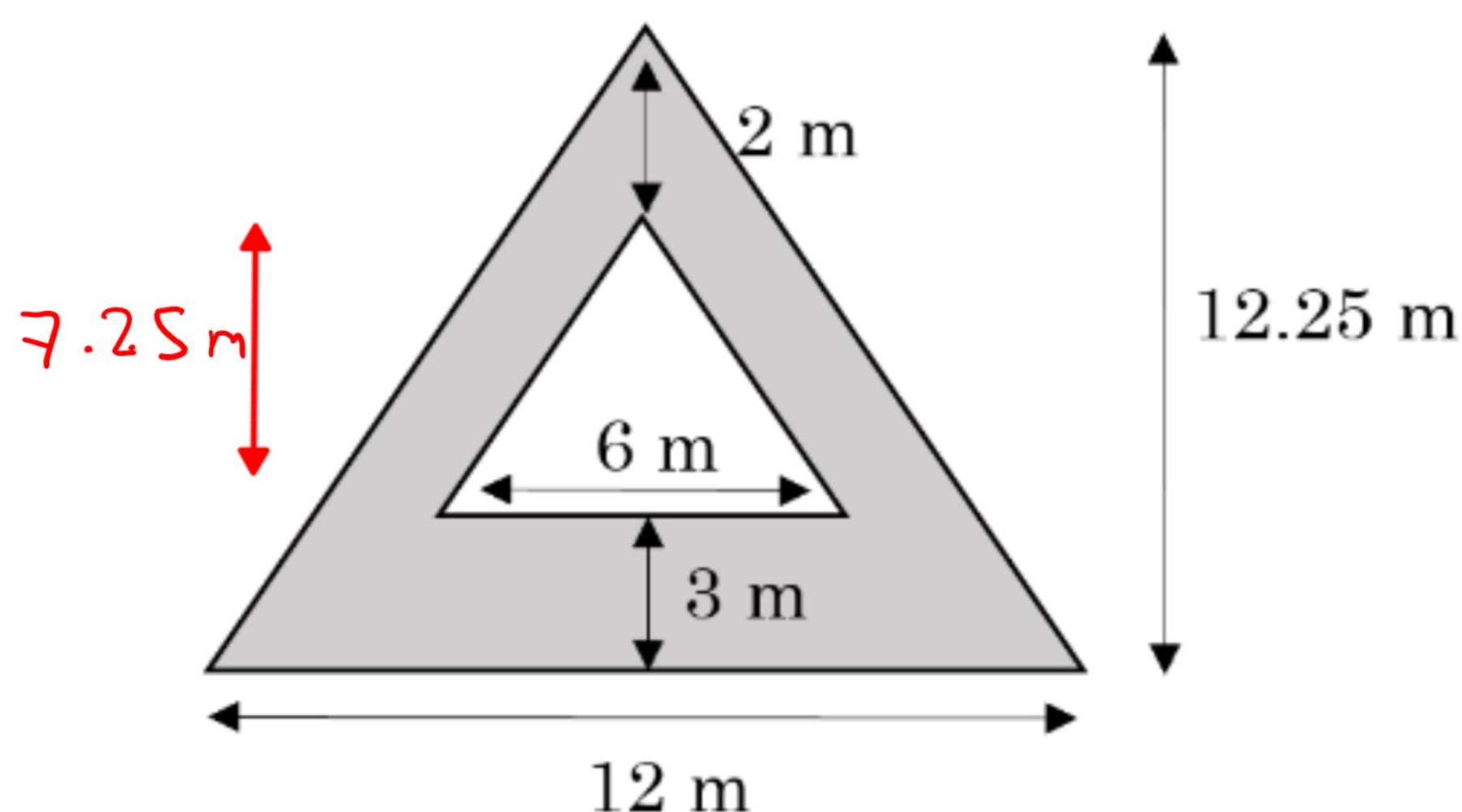
$$\begin{aligned} \text{Total} &= \frac{81\pi}{2} + 144 \\ &= 271.2 \text{ m}^2 \end{aligned}$$

Answer: 271.2 m²
(4 marks)



• Areas inside areas

Q5. Find the shaded area of the following shape, stating the correct units.



Find the shaded area, stating the correct units.

• Area shaded = area large Δ - area small Δ

• large Δ area = $\frac{1}{2} \times b \times h$
 $= \frac{1}{2} \times 12 \times 12.25$
 $= 73.5 \text{ m}^2$

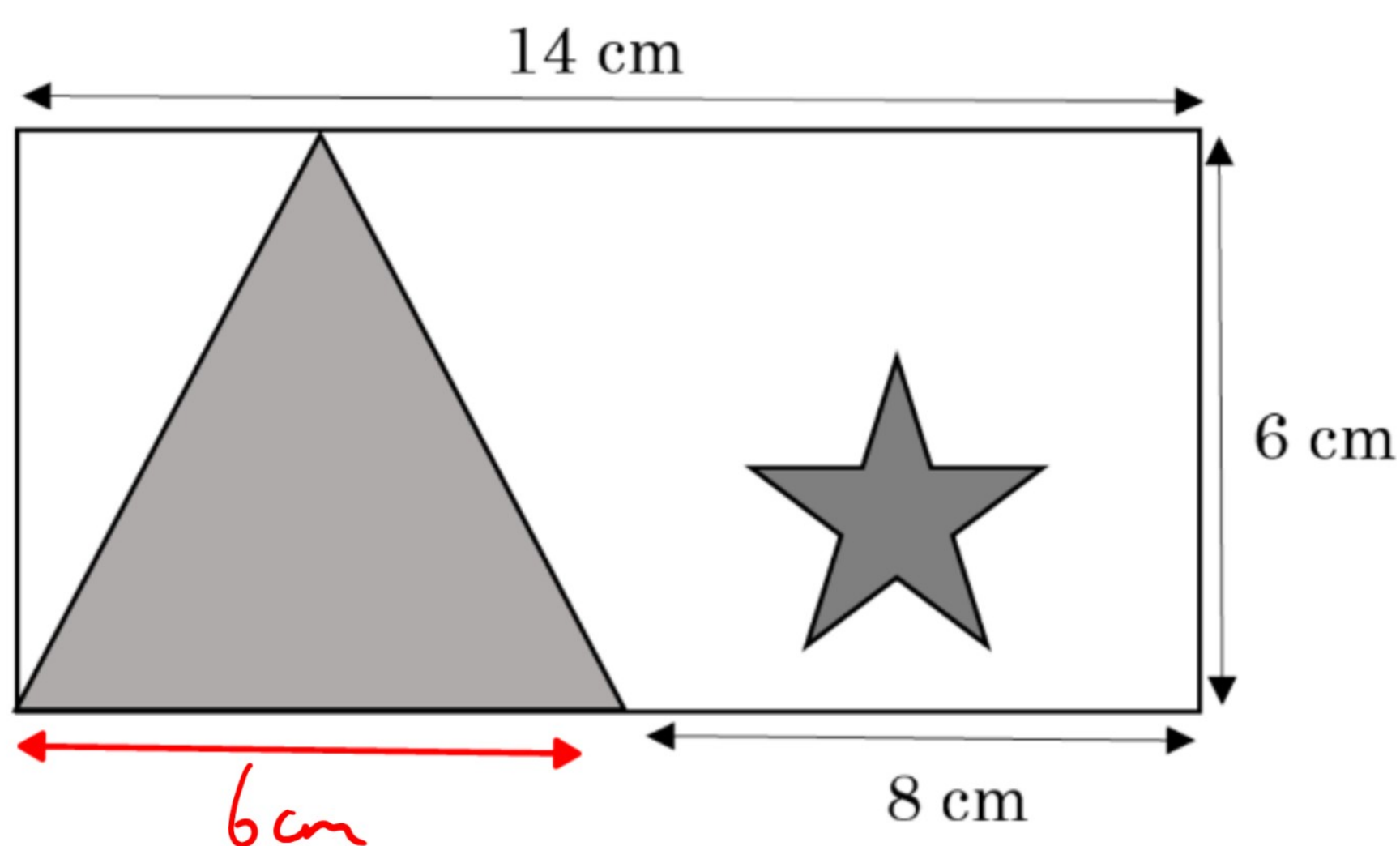
• small Δ area = $\frac{1}{2} \times b \times h$
 $= \frac{1}{2} \times 6 \times 7.25$
 $= 21.75 \text{ m}^2$

\Rightarrow Shaded area = $73.5 - 21.75$
 $= 51.75 \text{ m}^2$ Answer: 51.75 m²

(4 marks)



Q6. A rectangular logo for a new tennis racket is shown below. The area of the star shaped region is 15% of the area of the entire logo. Work out the area of the unshaded part of the logo.



$$\begin{aligned} \bullet \text{ Area } \triangle &= \frac{1}{2} \times b \times h \\ &= \frac{1}{2} \times 6 \times 6 \\ &= 18 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \bullet \text{ Area rectangle} &= 14 \times 6 \\ &= 84 \text{ cm}^2 \end{aligned}$$

$$\begin{aligned} \bullet \text{ Area star} &= \frac{15}{100} \times 84 \\ &= 12.6 \text{ cm}^2 \end{aligned}$$

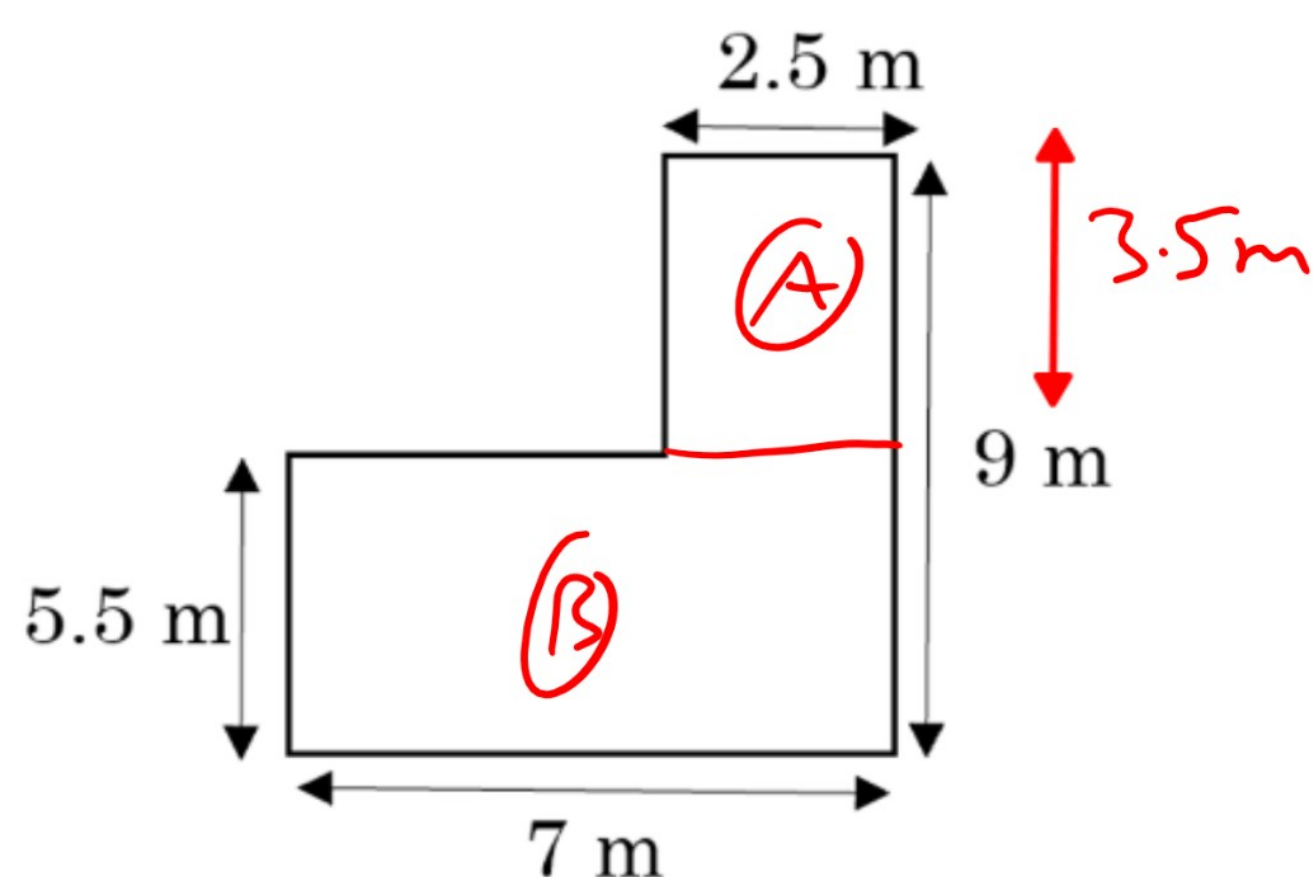
$$\begin{aligned} \Rightarrow \text{Unshaded} &= 84 - 18 - 12.6 \\ &= 53.4 \text{ cm}^2 \end{aligned}$$

Answer: 53.4 cm²

(4 marks)



Q7. Here is the plan of a living room. Stan wish to cover 90% of the total area with carpet, which costs £2.50 a square metre.
Work out the cost of carpeting his living room.



$$\begin{aligned}\text{Area (A)} &= 2.5 \times 3.5 \\ &= 8.75 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{Area (B)} &= 7 \times 5.5 \\ &= 38.5 \text{ m}^2\end{aligned}$$

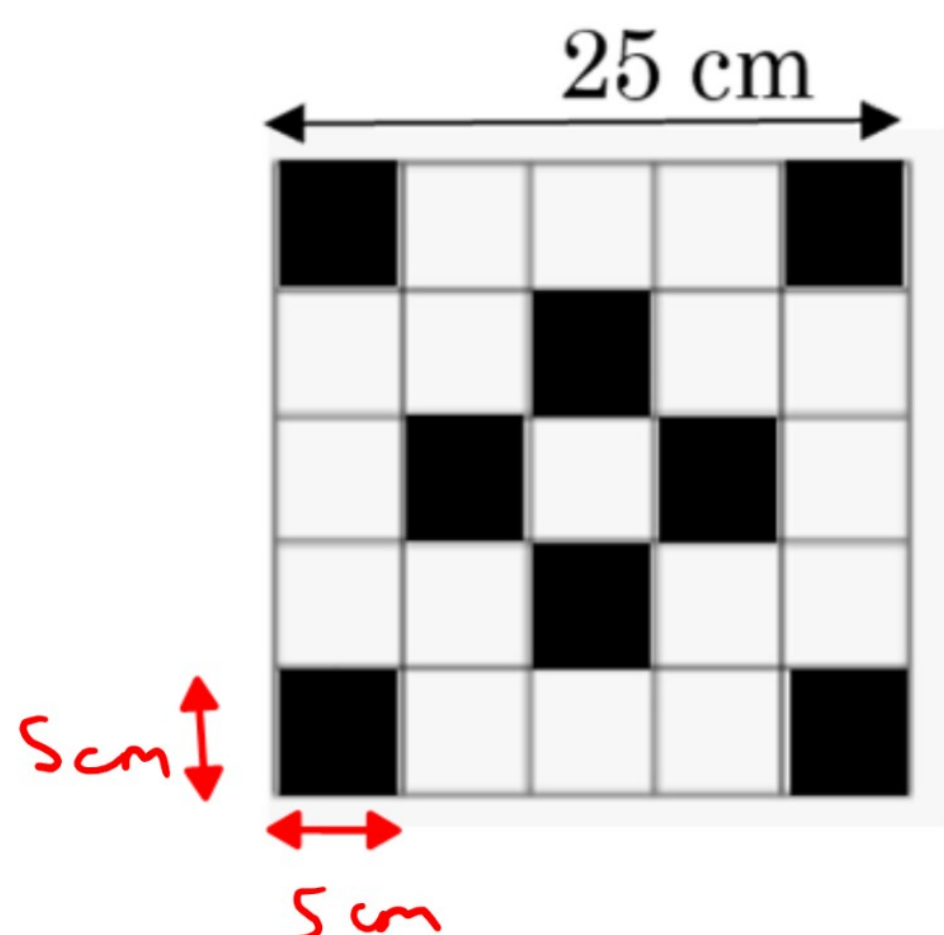
$$\begin{aligned}\text{Total area} &= 38.5 + 8.75 \\ &= 47.25\end{aligned}$$

$$\begin{aligned}\Rightarrow \text{Total area to carpet} &= \frac{90 \times 47.25}{100} \\ &= 42.525 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\Rightarrow \text{Total cost} &= 42.525 \times 2.50 \\ &= \underline{\underline{106.3125}}\end{aligned}$$

Answer: £106.31
(4 marks)

Q8. A mosaic is to be created by repeating the following patterned square:



If the mosaic is to measure 5m by 8m, work out the area of the white squares in the entire mosaic. Give your answer in metres squared.

- Each square above contains 16 white squares
- Next we show that the mosaic can be 'tiled' using the big squares without gaps:
- $8\text{m} = 800\text{cm}$, and $800 \div 25 = 32$
- and $5\text{m} = 500\text{cm}$, and $500 \div 25 = 20$
(no remainders; there are 6400 full big squares)

$\Rightarrow \frac{16}{25}$ of the mosaic is white

- Area full mosaic = 5×8
= 40m^2

\Rightarrow area white squares = $\frac{16}{25} \times 40$

Answer: 25.6 m²

= 25.6m^2

(4 marks)