

WA8MMGTW1

Two-dimensional space and structures

Core + Challenge

Converting Units of Area

I can convert between mm^2 , cm^2 , m^2 , hectares and km^2 , and explain why the conversion factors are squares of the length factors.

Name: _____ Date: _____ Score: _____ / 58

Key idea

1 cm = 10 mm, so $1 \text{ cm}^2 = 10 \text{ mm} \times 10 \text{ mm} = \mathbf{100 \text{ mm}^2}$. The area factor is the length factor **squared**.

$1 \text{ m}^2 = 100 \text{ cm} \times 100 \text{ cm} = \mathbf{10\,000 \text{ cm}^2}$. 1 **hectare** (ha) = $100 \text{ m} \times 100 \text{ m} = \mathbf{10\,000 \text{ m}^2}$. $1 \text{ km}^2 = \mathbf{100 \text{ ha}}$.

Big unit → small unit: multiply. **Small → big: divide.** $3.5 \text{ m}^2 = 35\,000 \text{ cm}^2$; $25\,000 \text{ m}^2 = 2.5 \text{ ha}$.

Mixed units: convert the lengths first. $2.5 \text{ m} \times 40 \text{ cm} = 250 \text{ cm} \times 40 \text{ cm} = 10\,000 \text{ cm}^2 = 1 \text{ m}^2$.

A

Fluency *practise the skill*

/ 16 marks

Convert to the unit shown. 1 mark each.

1. $4 \text{ cm}^2 \rightarrow \text{mm}^2$ _____

9. $5 \text{ ha} \rightarrow \text{m}^2$ _____

2. $2.5 \text{ cm}^2 \rightarrow \text{mm}^2$ _____

10. $1.2 \text{ ha} \rightarrow \text{m}^2$ _____

3. $700 \text{ mm}^2 \rightarrow \text{cm}^2$ _____

11. $35\,000 \text{ m}^2 \rightarrow \text{ha}$ _____

4. $85 \text{ mm}^2 \rightarrow \text{cm}^2$ _____

12. $800 \text{ m}^2 \rightarrow \text{ha}$ _____

5. $3 \text{ m}^2 \rightarrow \text{cm}^2$ _____

13. $2 \text{ km}^2 \rightarrow \text{ha}$ _____

6. $0.6 \text{ m}^2 \rightarrow \text{cm}^2$ _____

14. $75 \text{ ha} \rightarrow \text{km}^2$ _____

7. $45\,000 \text{ cm}^2 \rightarrow \text{m}^2$ _____

15. $1 \text{ km}^2 \rightarrow \text{m}^2$ _____

8. $2500 \text{ cm}^2 \rightarrow \text{m}^2$ _____

16. $0.4 \text{ m}^2 \rightarrow \text{mm}^2$ _____

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B**Core** *apply the skill to problems*

/ 22 marks

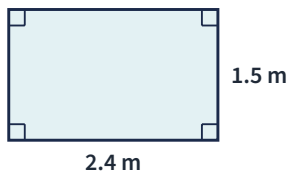
- 1 A phone screen is 15 cm by 7 cm. Find its area in cm^2 and in mm^2 . [2 marks]

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Answer: _____

- 2 A bathroom floor is 2.4 m by 1.5 m. (a) Find its area in m^2 and in cm^2 . (b) How many 30 cm by 30 cm tiles cover it exactly? [3 marks]

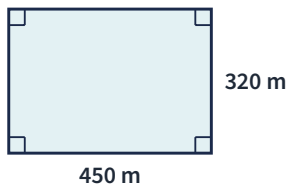


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Answer: _____

- 3 A Wheatbelt paddock is a rectangle 450 m by 320 m. Find its area in m^2 and in hectares. [2 marks]



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Answer: _____

- 4 Kings Park covers about 400 ha. Write this in km^2 and in m^2 . [2 marks]

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Answer: _____

- 5 Rottnest Island has an area of about 19 km^2 . Write this in hectares. [2 marks]

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Answer: _____

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- 6 A wheat farm has 2.5 km^2 of crop. The harvest is 2.2 tonnes per hectare. How many tonnes are harvested? [2 marks]

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Answer: _____

- 7 Write these areas in order from smallest to largest:
 0.05 km^2 , 4.8 ha , $52\,000 \text{ m}^2$, $490\,000\,000 \text{ cm}^2$ [3 marks]

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Answer: _____

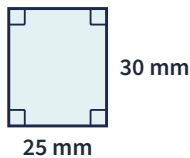
- 8 Instant turf costs \$12.50 per m^2 . How much does it cost to turf a lawn 12 m by 650 cm? [2 marks]

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Answer: _____

- 9 An Australia Post stamp is 25 mm by 30 mm. Find its area in cm^2 . [2 marks]



Answer: _____

- 10 A developer has a 1.5 ha site. Roads use 3000 m^2 and the rest is split into house blocks of 375 m^2 . How many blocks are there? [2 marks]

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Answer: _____

C

Reasoning *explain, justify and check*

/ 9 marks

- 1 The grid shows why $1 \text{ cm}^2 = 100 \text{ mm}^2$. Use the same idea to explain why $1 \text{ m}^2 = 10\,000 \text{ cm}^2$ and not 100 cm^2 . [2 marks]

$1 \text{ cm}^2 = 10 \text{ mm} \times 10 \text{ mm} = 100 \text{ mm}^2$ (each small square is 1 mm^2)



- 2 Tom writes $5 \text{ cm}^2 = 50 \text{ mm}^2$ because “ $1 \text{ cm} = 10 \text{ mm}$ ”. Explain his error and correct it. [2 marks]

- 3 True or false: “ 1 km^2 is 1000 times as big as 1 m^2 .” Explain. [2 marks]

- 4 A square paddock has an area of exactly 1 hectare. How long is each side? Explain why farmers measure land in hectares rather than in m^2 or km^2 . [3 marks]

D**Challenge** *multi-step and problem-solving*

/ 11 marks

- 1 An A4 sheet is 210 mm by 297 mm. What is the smallest number of A4 sheets that could cover 1 m^2 (sheets may be cut, but not overlapped)? Show why. [3 marks]

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Answer: _____

- 2 A square farm has an area of 64 ha. How many kilometres of fencing are needed to go all the way around it? [3 marks]

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Answer: _____

- 3 On a map, 1 cm represents 50 m. A park on the map is a 6 cm by 4 cm rectangle. Find the real area of the park in hectares. What real area does 1 cm^2 on the map represent? [3 marks]

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Answer: _____

- 4 12 mm of rain falls on a 2 ha paddock. How many litres of water is that? ($1 \text{ m}^3 = 1000 \text{ L}$) [2 marks]

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Answer: _____

How did I go?Fluency ____ / 16 Core ____ / 22 Reasoning ____ / 9 Challenge ____ / 11 **Total ____ / 58**

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