

Reasoning and Problem Solving

Step 4: Area of Compound Shapes

National Curriculum Objectives:

Mathematics Year 5: (5M7b) [Calculate and compare the area of rectangles \(including squares\), and including using standard units, square centimetres \(cm²\) and square metres \(m²\) and estimate the area of irregular shapes](#)

Differentiation:

Questions 1, 4 and 7 (Problem Solving)

Developing Investigate different compound shapes that comply with a given set of criteria. Using whole lengths of the same unit (mm or cm only).

Expected Investigate different compound shapes that comply with a given set of criteria. Includes whole lengths of mm and m.

Greater Depth Investigate different compound shapes that comply with a given set of criteria. Includes lengths of m and cm up to 1 decimal place.

Questions 2, 5 and 8 (Problem Solving)

Developing Find missing lengths for both shapes using the criteria given. Using whole lengths of the same unit (mm or cm only).

Expected Find missing lengths for both shapes using the criteria given. Using whole lengths of different units (mm and cm; cm and m).

Greater Depth Find missing lengths for both shapes using the criteria given. Using lengths of different units (mm and cm; cm and m) up to 1 decimal place.

Questions 3, 6 and 9 (Reasoning)

Developing A compound shape and the possible area is provided. Pupils to decide if the area is correct or not and provide evidence for their answer. Using whole lengths of the same unit (mm or cm only).

Expected A compound shape and the possible area is provided. Pupils to decide if the area is correct or not and provide evidence for their answer. Using whole lengths of different units (mm and cm; cm and m).

Greater Depth Find a missing area of a compound shape where the lengths for the missing shape are unclear. Using lengths of different units (mm and cm; cm and m) up to 1 decimal place.

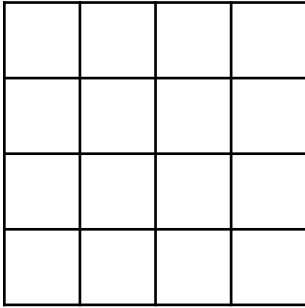
More [Year 5 Perimeter and Area](#) resources.

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Area of Compound Shapes

Area of Compound Shapes

1a. Each square has an area of 4cm^2 .



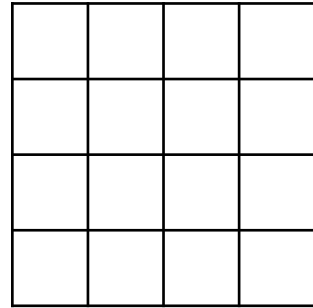
Draw 3 different compound shapes that have an area of 16cm^2 .



Not to scale

PS

1b. Each square has an area of 1cm^2 .



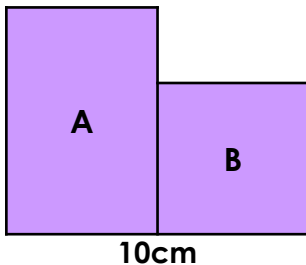
Draw 3 different compound shapes that have an area of 12cm^2 .



Not to scale

PS

2a. Add the missing lengths to make the following statement correct.



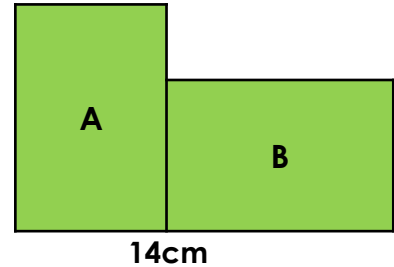
A has an area of 45cm^2 and B has an area of 25cm^2 .



Not to scale

PS

2b. Add the missing lengths to make the following statement correct.



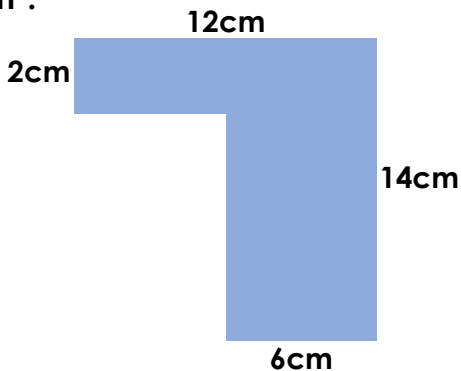
A has an area of 48cm^2 and B has an area of 48cm^2 .



Not to scale

PS

3a. Muna thinks the area of the shape is 108cm^2 .



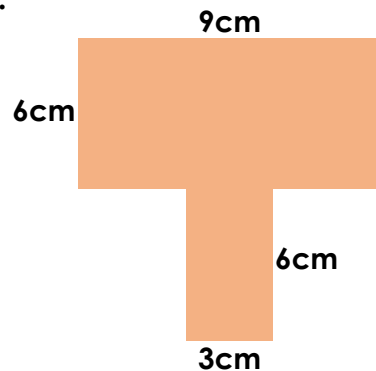
Is she correct? Convince me.



Not to scale

R

3b. Ryan thinks the area of the shape is 24cm^2 .



Is he correct? Convince me.



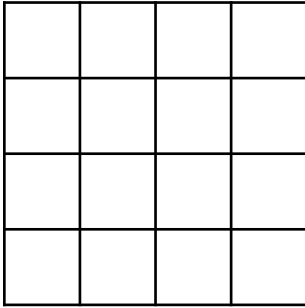
Not to scale

R

Area of Compound Shapes

Area of Compound Shapes

4a. Each square has an area of 4mm^2 .



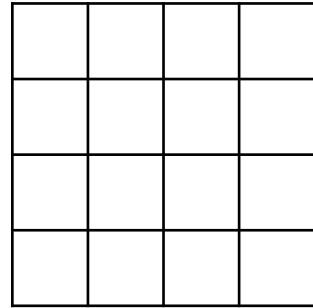
Draw 3 different compound shapes that have an area of 36mm^2 .



Not to scale

PS

4b. Each square has an area of 9m^2 .



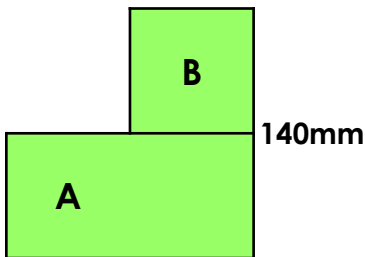
Draw 3 different compound shapes that have an area of 72m^2 .



Not to scale

PS

5a. Add the missing lengths to make the following statement correct.



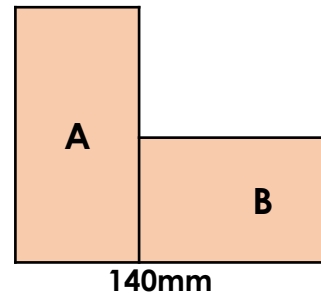
A has an area of 84cm^2 and B has an area of 49cm^2 .



Not to scale

PS

5b. Add the missing lengths to make the following statement correct.



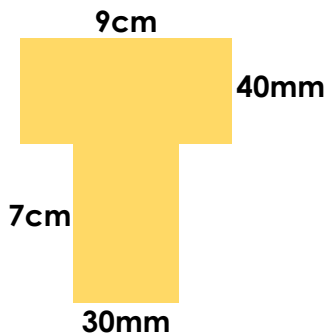
A has an area of 60cm^2 and B has an area of 48cm^2 .



Not to scale

PS

6a. Oscar thinks the area of the shape is 57mm^2 .



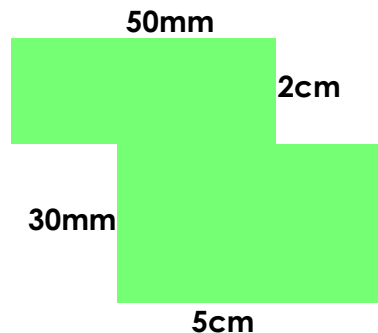
Is he correct? Convince me.



Not to scale

R

6b. Josie thinks the area of the shape is 25cm^2 .



Is she correct? Convince me.



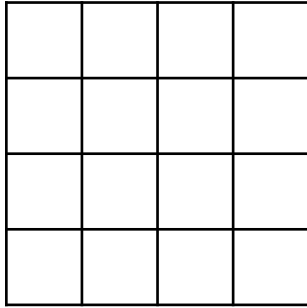
Not to scale

R

Area of Compound Shapes

Area of Compound Shapes

7a. Each square has an area of 1.5m^2 .



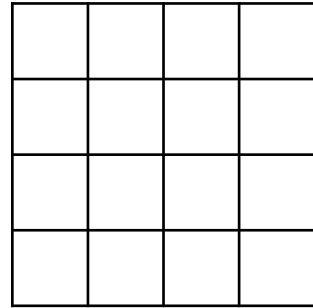
Draw 3 different compound shapes that have an area of 12m^2 .



Not to scale

PS

7b. Each square has an area of 2.2cm^2 .



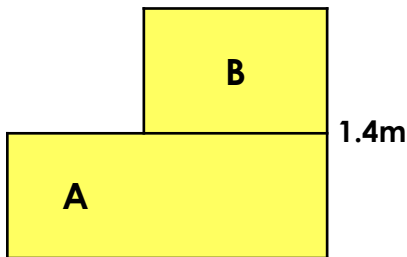
Draw 3 different compound shapes that have an area of 22cm^2 .



Not to scale

PS

8a. Add the missing lengths to make the following statement correct.



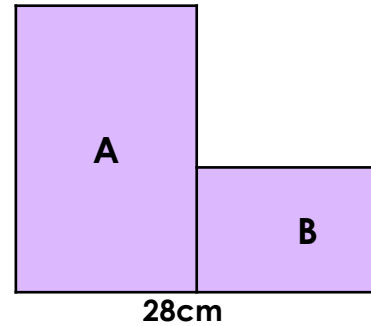
A has an area that is twice as large as B.



Not to scale

PS

8b. Add the missing lengths to make the following statement correct.



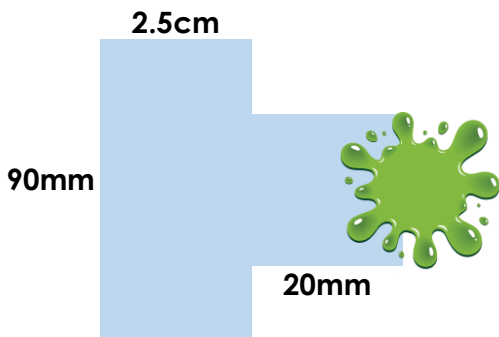
A has an area that is twice as large as B.



Not to scale

PS

9a. Flora thinks the area of the shape must be smaller than 30cm^2 .



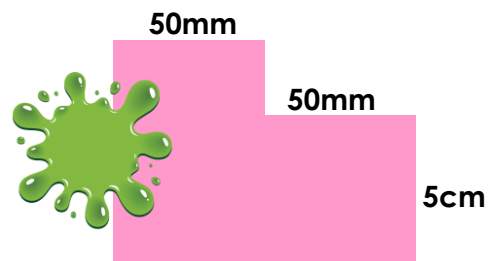
Is she correct? Convince me.



Not to scale

R

9b. Saul thinks the area of the shape must be greater than 35cm^2 .



Is he correct? Convince me.



Not to scale

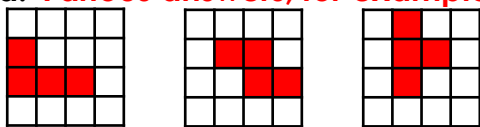
R

Reasoning and Problem Solving

Area of Compound Shapes

Developing

1a. Various answers, for example:



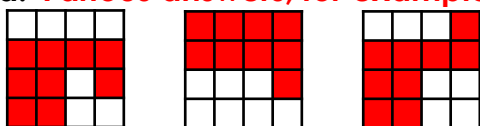
Accept any compound shapes with an area of 16cm^2 . Each shape should have 4 squares shaded.

2a. A. $9 \times 5 = 45\text{cm}^2$; B. $5 \times 5 = 25\text{cm}^2$

3a. Muna is incorrect. $12\text{cm} \times 2\text{cm} = 24\text{cm}^2$; $12\text{cm} \times 6\text{cm} = 72\text{cm}^2$; $72\text{cm}^2 + 24\text{cm}^2 = 96\text{cm}^2$

Expected

4a. Various answers, for example:



Accept any compound shapes with an area of 36mm^2 . Each shape should have 9 squares shaded.

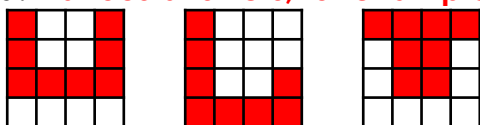
5a. Various answers, for example:

A. $7 \times 12 = 84\text{cm}^2$; B. $7 \times 7 = 49\text{cm}^2$

6a. Oscar is incorrect. $9\text{cm} \times 40\text{mm} = 36\text{cm}^2$; $7\text{cm} \times 30\text{mm} = 21\text{cm}^2$; $36\text{cm}^2 + 21\text{cm}^2 = 57\text{cm}^2$. Josie has not converted from mm to cm.

Greater Depth

7a. Various answers, for example:



Accept any compound shape with an area of 12m^2 . Each shape should have 8 squares shaded.

8a. Various answers, for example:

A = $16 \times 0.7 = 11.2\text{m}^2$; B = $8 \times 0.7 = 5.6\text{m}^2$.

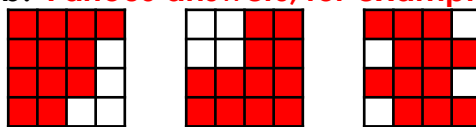
9a. Flora might not be correct. We know that $9 \times 2.5 = 22.5\text{cm}^2$ and we know one of the other sides is 2cm. The missing number would have to be smaller than 3.75cm to have an area smaller than 30cm^2 . However, the missing length could be greater than 3.75cm.

Reasoning and Problem Solving

Area of Compound Shapes

Developing

1b. Various answers, for example:



Accept any compound shapes with an area of 12cm^2 . Each shape should have 12 squares shaded.

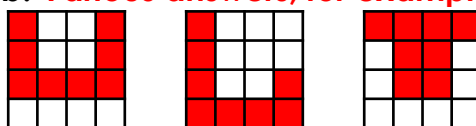
2b. Various answers, for example:

A. $8 \times 6 = 48\text{cm}^2$; B = $6 \times 8 = 48\text{cm}^2$

3b. Ryan is incorrect. $9\text{cm} \times 6\text{cm} = 54\text{cm}^2$; $6\text{cm} \times 3\text{cm} = 18\text{cm}^2$; $54\text{cm}^2 + 18\text{cm}^2 = 72\text{cm}^2$

Expected

4b. Various answers, for example:



Accept any compound shapes with an area of 72m^2 . Each shape should have 8 squares shaded.

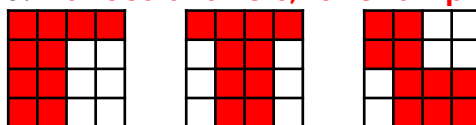
5b. Various answers, for example:

A. $6 \times 10 = 60\text{cm}^2$; B. $8 \times 6 = 48\text{cm}^2$

6b. Josie is correct. $2\text{cm} \times 5\text{cm} = 10\text{cm}^2$; $3\text{cm} \times 5\text{cm} = 15\text{cm}^2$; $10\text{cm}^2 + 15\text{cm}^2 = 25\text{cm}^2$

Greater Depth

7b. Various answers, for example:



Accept any compound shape with an area of 22cm^2 . Each shape should have 10 squares shaded.

8b. Various answers, for example:

A = $14 \times 4 = 56\text{cm}^2$; B = $14 \times 2 = 28\text{cm}^2$.

9b. It is possible for Saul to be correct. We know part of the shape's area as $5 \times 5 = 25\text{cm}^2$. We know that on the unlabelled rectangle, one side is 5cm. The missing side also appears to be longer than 5cm, so to multiply 5 by anything greater than 5 will give a total area greater than 35cm^2 .