

Reasoning and Problem Solving

Step 3: Area of Rectangles

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 (Reasoning)

Developing Find the area of a room and calculate how many tiles would be needed to cover the area when calculating the area of rectangles by counting squares and begin to use the correct formula. Whole numbers only.

Expected Find the area of a room and calculate how many tiles would be needed to cover the area when calculating the area of rectangles by using the correct formula. Includes some use of decimals and rounding to estimate.

Greater Depth Find the area of two tiles and calculate how many tiles would be needed to cover the area when calculating the area of rectangles using the correct formula. Includes some use of decimals, rounding to estimate and conversion of units.

Questions 2, 5 and 8 (Problem Solving)

Developing Use the area to calculate the possible dimensions of a rectangle when calculating the area of rectangles by counting squares and beginning to use the correct formula. Whole numbers only.

Expected Use the area to calculate the possible dimensions of a rectangle when calculating the area of rectangles by using the correct formula. Includes some use of decimals and rounding to estimate.

Greater Depth Use the combined area to calculate the possible dimensions of two rectangles when calculating the area of rectangles using the correct formula. Includes some use of decimals and rounding to estimate.

Questions 3, 6 and 9 (Reasoning)

Developing Explain the error made and find the correct area when calculating the area of rectangles by counting squares and begin to use the correct formula. Whole numbers only.

Expected Explain the error made and find the correct area when calculating the area of rectangles by using the correct formula. Includes some use of decimals and rounding to estimate.

Greater Depth Explain whether they agree or disagree by finding the correct areas when calculating the area of rectangles using the correct formula. Includes some use of decimals, rounding to estimate and conversion of units.

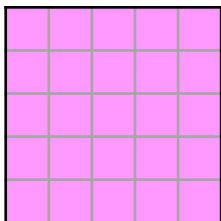
More [Year 5 Area and Perimeter](#) resources.

Did you like this resource? Don't forget to [review](#) it on our website.

Area of Rectangles

1a. Hafsa is buying wooden tiles for all the downstairs rooms in her house.

The area of each tile is 1m^2 .



Hafsa thinks that she needs 25 tiles. Is she correct? Explain your answer.



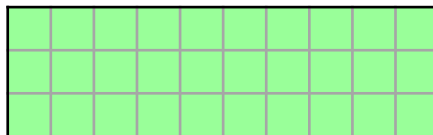
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R

Area of Rectangles

1b. Chuan is buying floor tiles for the school hall.

The area of each tile is 1m^2 .



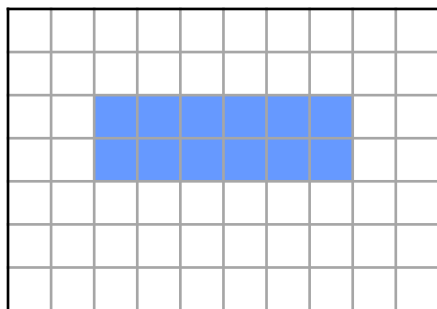
Chuan thinks he needs to order 27 tiles. Is he correct? Explain your answer.



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2a. This rectangle has an area of 12cm^2 . Find other possible lengths and widths which give the same area.



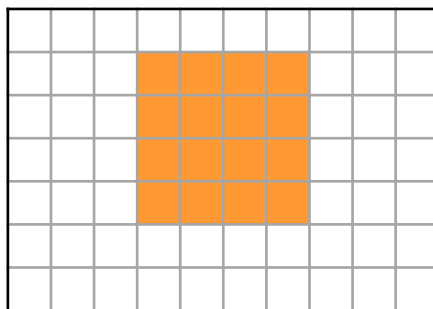
Find 2 possible answers.



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PS

2b. This rectangle has an area of 16cm^2 . Find other possible lengths and widths which give the same area.



Find 2 possible answers.



Not to scale

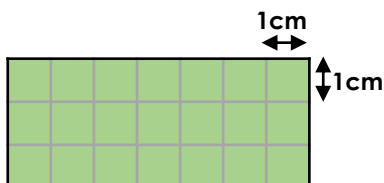
PS

3a. Lucy has calculated the area of a rectangle.



Lucy

The area of this rectangle is 20cm^2 because $3\text{cm} \times 7\text{cm} = 20\text{cm}^2$.



Is Lucy correct? Prove it.



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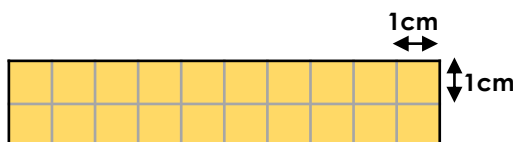
R

3b. Cian has estimated the area of a rectangle.



Cian

The estimated area of this rectangle is 18cm^2 because $2\text{cm} \times 9\text{cm} = 18\text{cm}^2$.



Is Cian correct? Prove it.



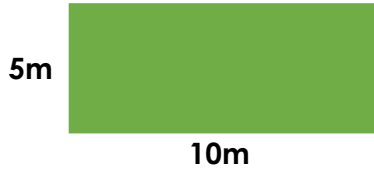
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Area of Rectangles

4a. Mrs Kelly is buying turf tiles for the playing field at school.

The area of each tile is 2m^2 .



Mrs Kelly thinks she needs to order 50 tiles.

Is she correct? Explain your answer.



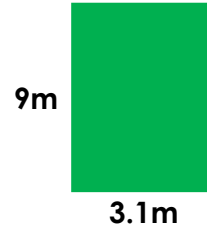
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Area of Rectangles

4b. Ben is buying turf tiles for his garden.

The area of each tile is 3m^2 .



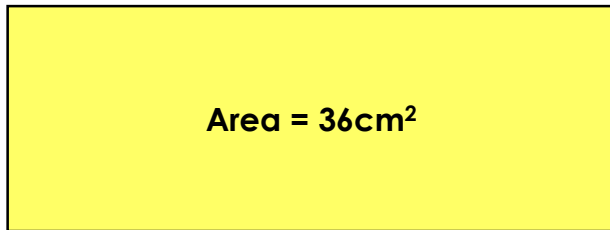
Ben thinks he needs to order 9 tiles. Is he correct? Explain your answer.



Not to scale

R

5a. A rectangle has an area of 36cm^2 . What could the dimensions be?



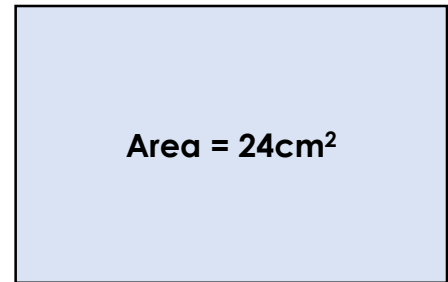
Find 3 possible answers.



Not to scale

PS

5b. A rectangle has an area of 24cm^2 . What could the dimensions be?



Find 3 possible answers.



Not to scale

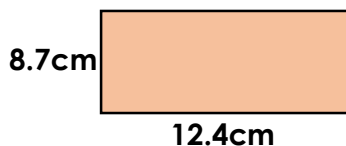
PS

6a. Sinead has estimated the area of a rectangle.



Sinead

The estimated area of this rectangle is 96cm^2 because $8\text{cm} \times 12\text{cm} = 96\text{cm}^2$.



Is Sinead correct? Prove it.



Not to scale

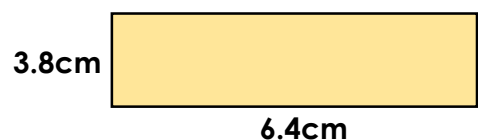
R

6b. Josh has estimated the area of a rectangle.



Josh

The estimated area of this rectangle is 24cm^2 because $4\text{cm} \times 6\text{cm} = 24\text{cm}^2$.



Is Josh correct? Prove it.

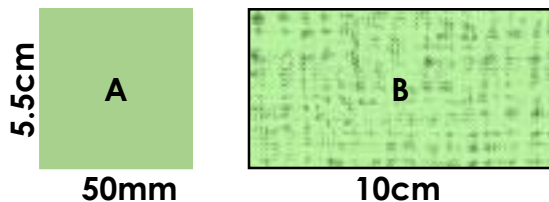


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Area of Rectangles

7a. Gabriel is creating a mosaic that has an area of approximately 600cm^2 . He wants to use two different tiles.



If he uses 10 of tile B, he thinks he will be able to use 3 tile A's in the remaining area.

Is he correct? Explain your answer.

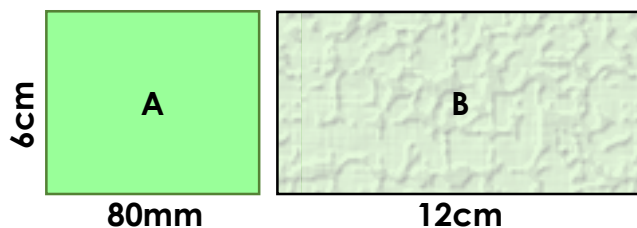


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Area of Rectangles

7b. Isabel is creating a pattern that has an area of approximately 672cm^2 . She wants to use two different tiles.



If she uses 5 of tile A, she thinks she will be able to use 8 tile B's in the remaining area.

Is she correct? Explain your answer.



Not to scale

R

8a. Two rectangles have a combined area of approximately 10cm^2 .

What could the dimensions of each rectangle be?

The rectangles have different areas. At least one rectangle has a side which is a decimal number.

Find 3 possible answers.



Not to scale

PS

8b. Two rectangles have a combined area of approximately 25m^2 .

What could the dimensions of each rectangle be?

The rectangles have different areas. At least one rectangle has a side which is a decimal number.

Find 3 possible answers.



Not to scale

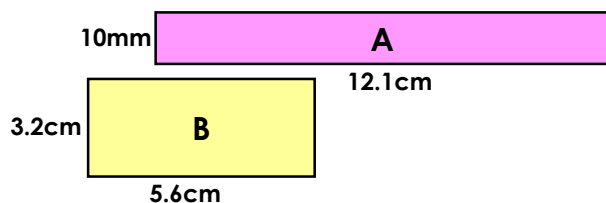
PS

9a. Alice has made a large rectangle using multiples of the rectangles below.



Alice

I can use six rectangles to create a large rectangle with an approximate area of 96cm^2 .



Is Alice correct? Prove it.



Not to scale

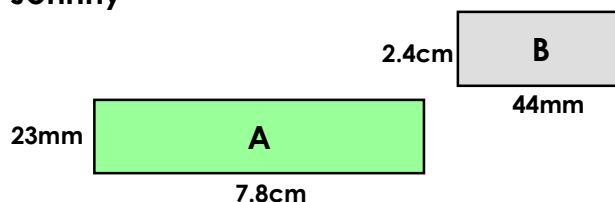
R

9b. Johnny has made a large rectangle using multiples of the rectangles below.



Johnny

I can use nine rectangles to create a large rectangle with an approximate area of 128cm^2 .



Is Johnny correct? Prove it.



Not to scale

R

Reasoning and Problem Solving

Area of Rectangles

Developing

1a. Hafsa is correct because $5\text{cm} \times 5\text{cm} = 25\text{cm}^2$ so 25 tiles are needed.

2a. Various answers, for example:

$W=3\text{cm}$ and $L=4\text{cm}$, $W=1\text{cm}$ and $L=12\text{cm}$

3a. Lucy is incorrect because she has miscalculated. $3\text{cm} \times 7\text{cm} = 21\text{cm}^2$ not 20cm^2 .

Expected

4a. Mrs Kelly is incorrect because she has found the area of the playing field, but she needed to divide the area by 2 because the tiles are 2m^2 . $50\text{m}^2 \div 2\text{m}^2 = 25$. Mrs Kelly needs 25 tiles.

5a. Various answers, for example:

$3\text{cm} \times 12\text{cm}$, $6\text{cm} \times 6\text{cm}$, $4\text{cm} \times 9\text{cm}$

6a. Sinead is incorrect she has rounded 8.7 to 8 rather than 9 to help her find the area. She should have completed $9\text{cm} \times 12\text{cm}$ which equals 108cm^2 .

Greater Depth

7b. Gabriel is incorrect because 10 tile B's has an area of 550cm^2 . There will be a remaining area of 50cm^2 which is less than 2 of tile A.

8a. Various answers, for example:

A. $16\text{cm} \times 0.5\text{cm}$ B. $2\text{cm} \times 1\text{cm}$

A. $3\text{cm} \times 2\text{cm}$ B. $8\text{cm} \times 0.5\text{cm}$

A. $7\text{cm} \times 1\text{cm}$ B. $6\text{cm} \times 0.5\text{cm}$

9a. Alice is correct. 2 A's and 4 B's create a rectangle with an approximate area of 96cm^2 .

Reasoning and Problem Solving

Area of Rectangles

Developing

1b. Chuan is incorrect because $3\text{cm} \times 10\text{cm} = 30\text{cm}^2$ not 27cm^2 so 30 tiles are needed.

2b. Various answers, for example:

$W=2\text{cm}$ and $L=8\text{cm}$, $W=1\text{cm}$ and $L=16\text{cm}$

3b. Cian is incorrect because he has miscounted the squares. The length is 10cm not 9cm and $2\text{cm} \times 10\text{cm} = 20\text{cm}^2$.

Expected

4b. Ben is incorrect because he has not accounted for when he rounded down for finding the area. He will need one extra tile to cover the 9 lots of 0.1 (0.9) that he has not accounted for. He needs 10 tiles.

5b. Various answers, for example:

$2\text{cm} \times 12\text{cm}$, $3\text{cm} \times 8\text{cm}$, $6\text{cm} \times 4\text{cm}$

6b. Josh is correct because he has rounded the decimal numbers correctly to help him find the area and completed $4\text{cm} \times 6\text{cm}$ which is 24cm^2 .

Greater Depth

7b. Isabel is incorrect because 5 tile A's has an area of 240cm^2 . There will be a remaining area of 432cm^2 which is 6 tile B's.

8b. Various answers, for example:

A. $5\text{m} \times 4\text{m}$ B. $10\text{m} \times 0.5\text{m}$

A. $40\text{m} \times 0.5\text{m}$ B. $5\text{m} \times 1\text{m}$

A. $20\text{m} \times 1\text{m}$ B. $2.5\text{m} \times 2\text{m}$

9b. Johnny is correct. 7 A's and 2 B's create an approximate area of 128cm^2 .