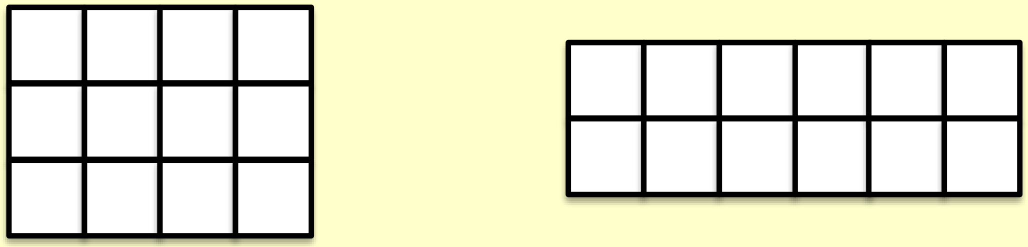
- For this specific unit of work, children will need squared paper for some activities.
- If you do not have access to squared paper, or are unable to print squared paper from the website, the children may need to miss the activities that require this resource.
- I have tried to incorporate activities that the children can complete without squared paper, but this has not been possible in all cases.

Perimeter, Area and Volume

Day 1

Starter

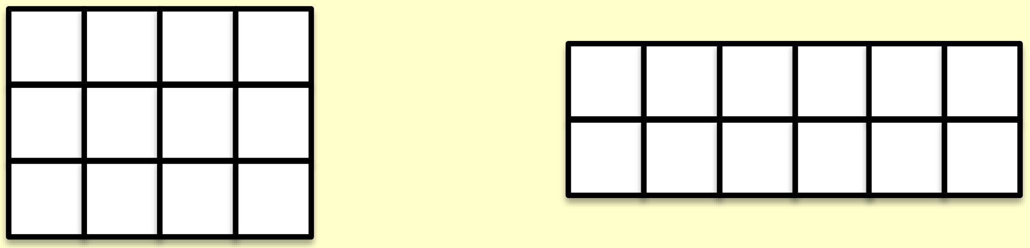
If each of the small white squares represents $1cm^2$, what's the same and what's different about the two rectangles shown below?



Explain your answer.

Starter - ANSWERS

Both rectangles are made of a total of twelve squares, so they have the same area, 12cm^2. They have different side lengths. The left-hand rectangle is 3cm tall and 4cm wide, whereas the right-hand rectangle is 2cm tall and 6cm wide.



Date: Day 1

LO: To investigate rectangles and rectilinear shapes with the same area.

Key Vocabulary

Date: Day 1

LO: To investigate rectangles and rectilinear shapes with the same area.

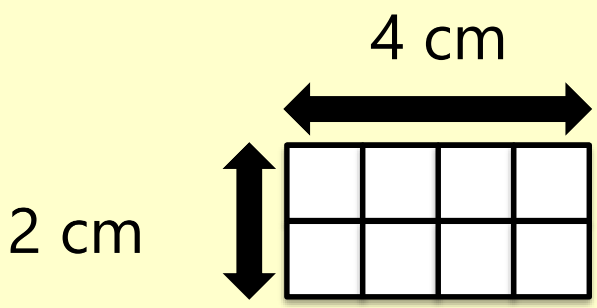
Success Criteria

I can $1cm^2$ grids to help me investigate rectangles and rectilinear shapes with the same area.

I can explain my reasoning.

Descriptive Doing

Referring to the diagram provided, complete the sentences below:



You don't need to write the sentences, just say them out loud!

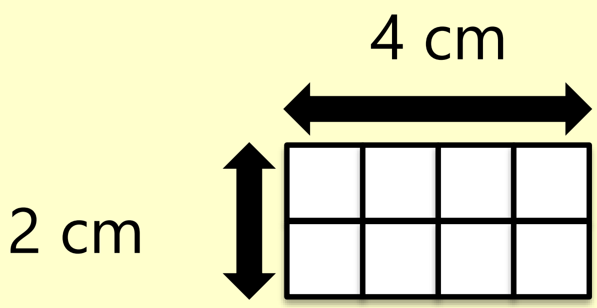
The rectangle has a height of __ cm.

The rectangle has a width of __ cm.

The rectangle is made of __ small squares.

The rectangle has an area of __ cm^2.

Descriptive Doing - ANSWERS



The rectangle has a height of **2** cm.

The rectangle has a width of 4 cm.

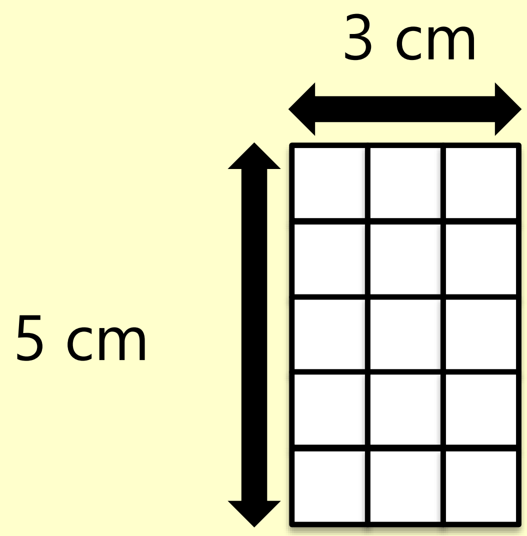
The rectangle is made of 8 small squares.

The rectangle has an area of 8 cm^2.

Descriptive Doing

Referring to the diagram provided, complete the sentences below:

You don’t need to write the sentences, just say them out loud!



The rectangle has a height of __ cm.

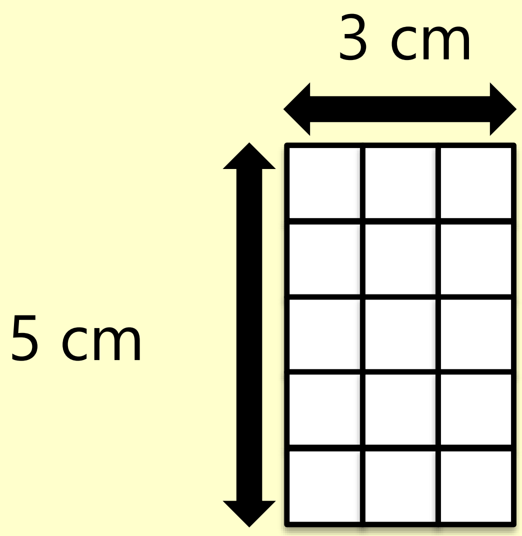
The rectangle has a width of __ cm.

The rectangle is made of __ small squares.

The rectangle has an area of __ cm^2.

Descriptive Doing - ANSWERS

Referring to the diagram provided, complete the sentences below:



The rectangle has a height of **5** cm.

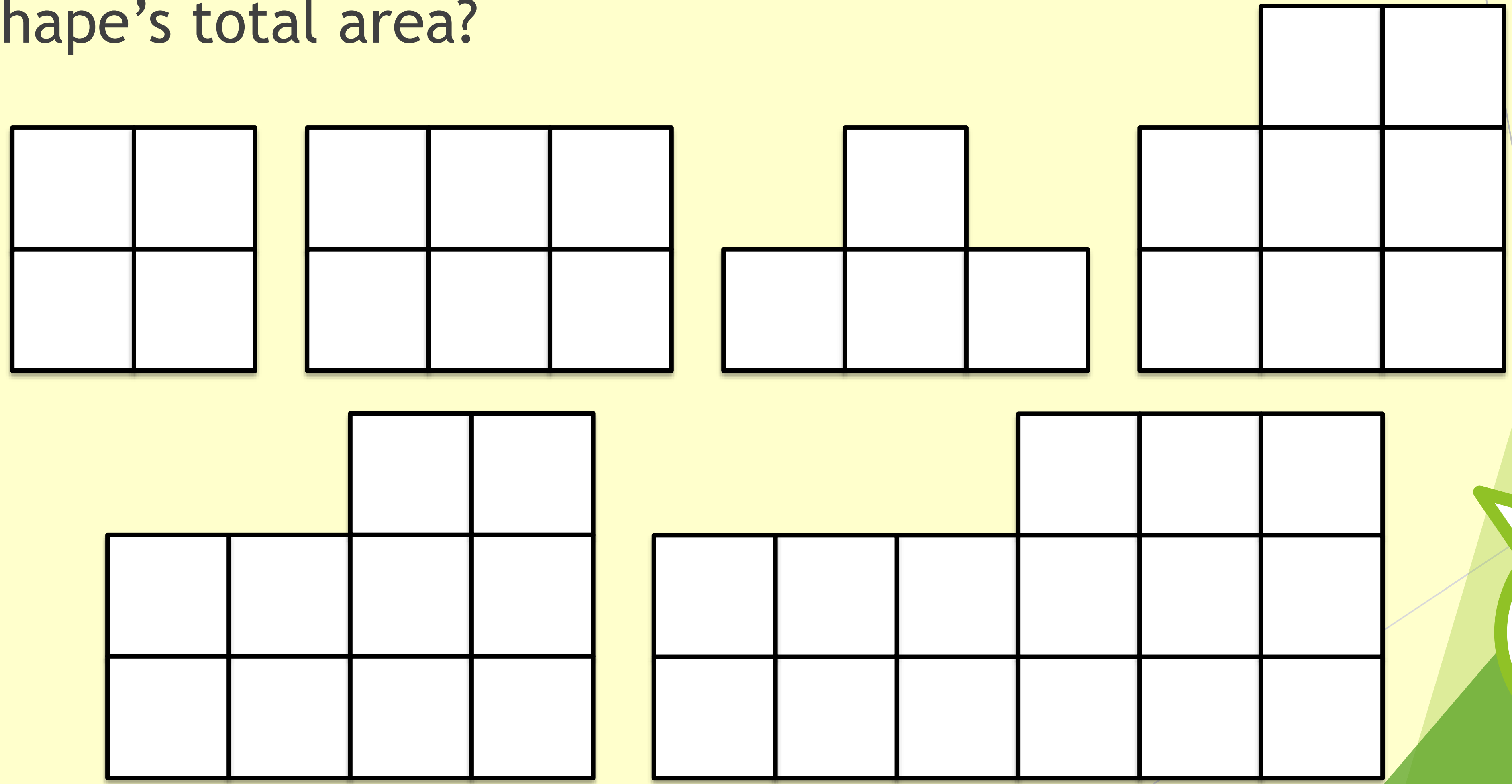
The rectangle has a width of **3** cm.

The rectangle is made of **15** small squares.

The rectangle has an area of 15 cm^2.

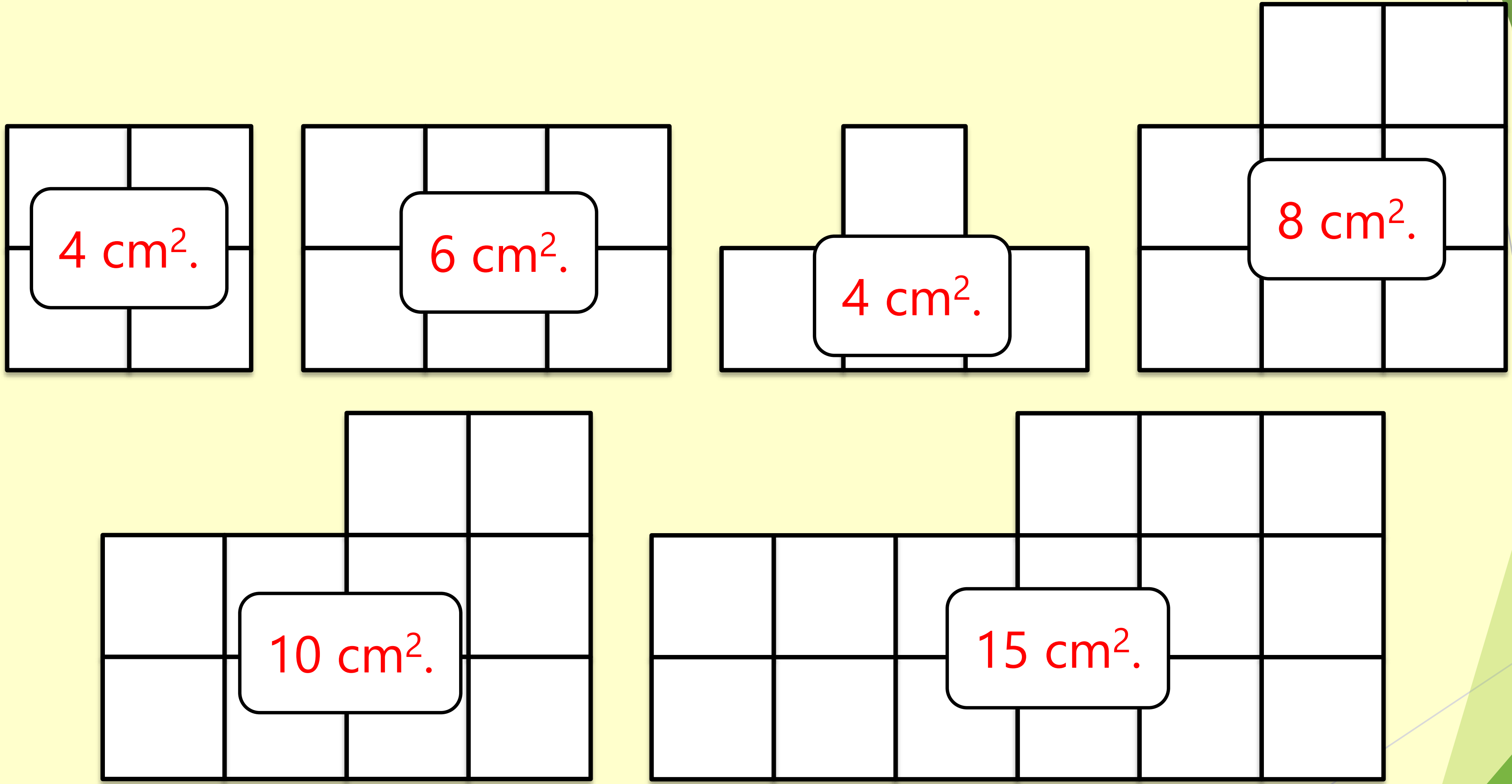
Descriptive Doing

If each smaller square has an area of 1cm², what is the shape's total area?



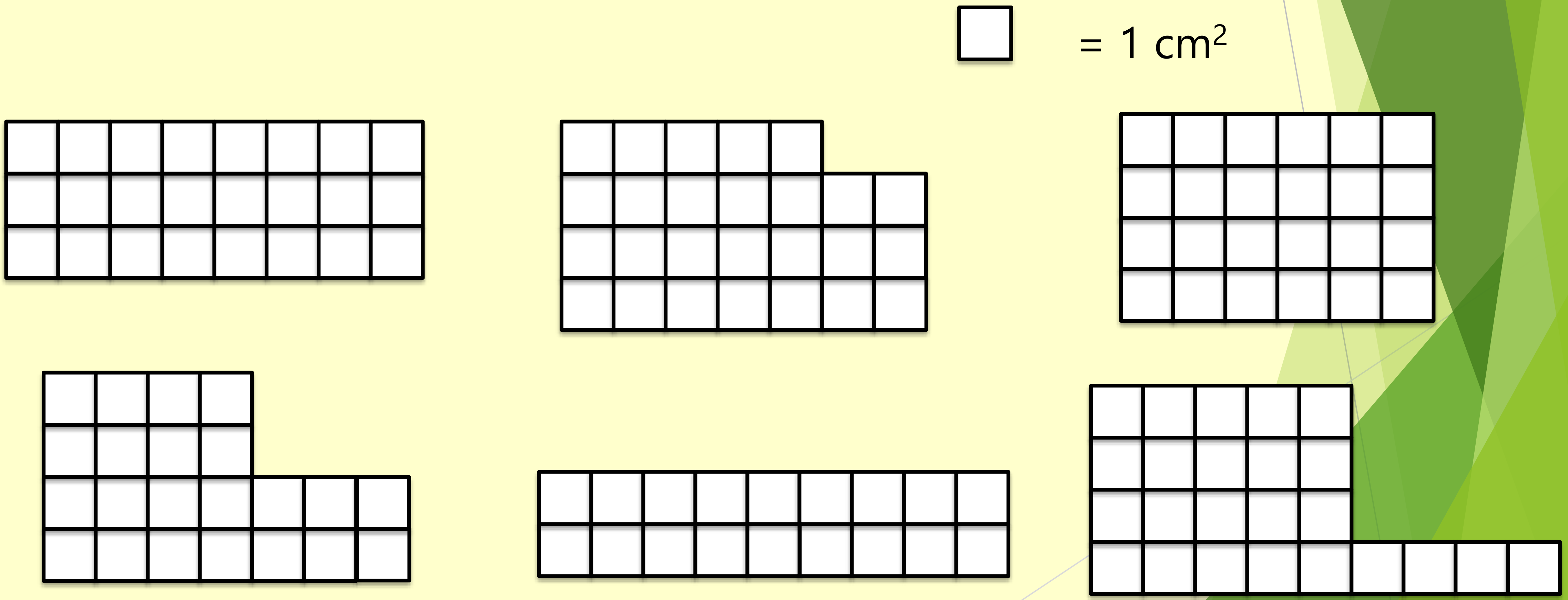
Say the area out loud for each shape.

Descriptive Doing - ANSWERS

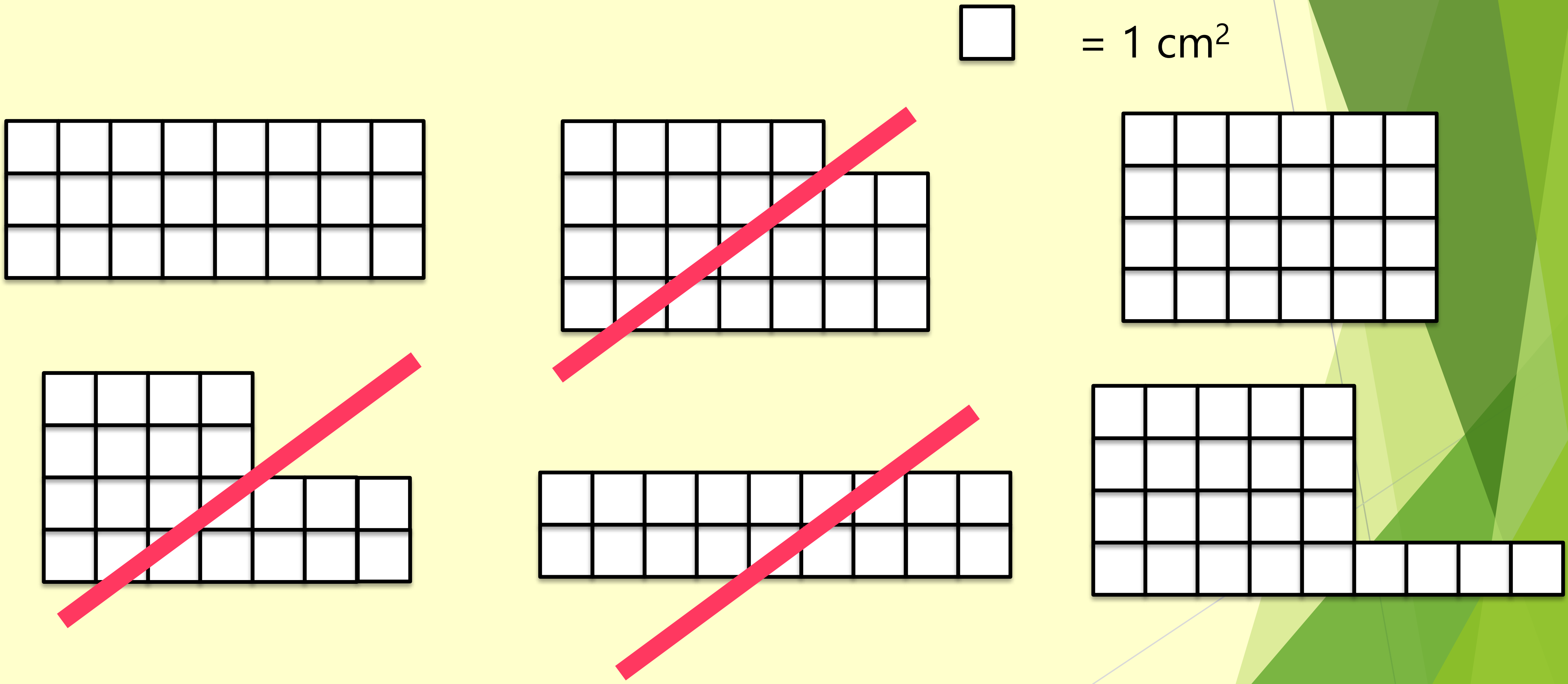


Descriptive Doing

Point to the shapes that do not have an area of 24cm².

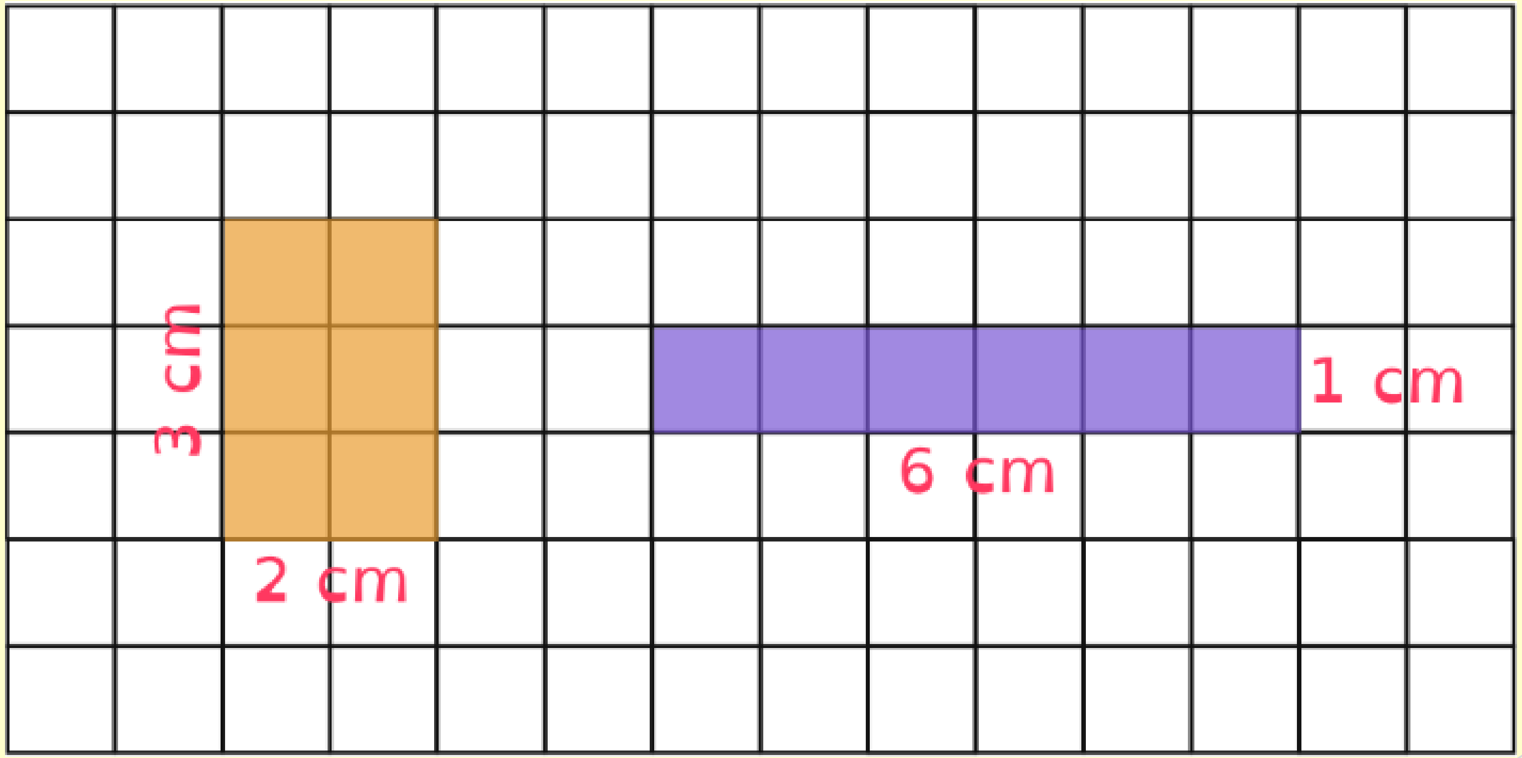


Descriptive Doing - ANSWERS



Reflective Teaching

I have drawn two different rectangles that have an area of $6cm^2$.



□ = 1 cm^2

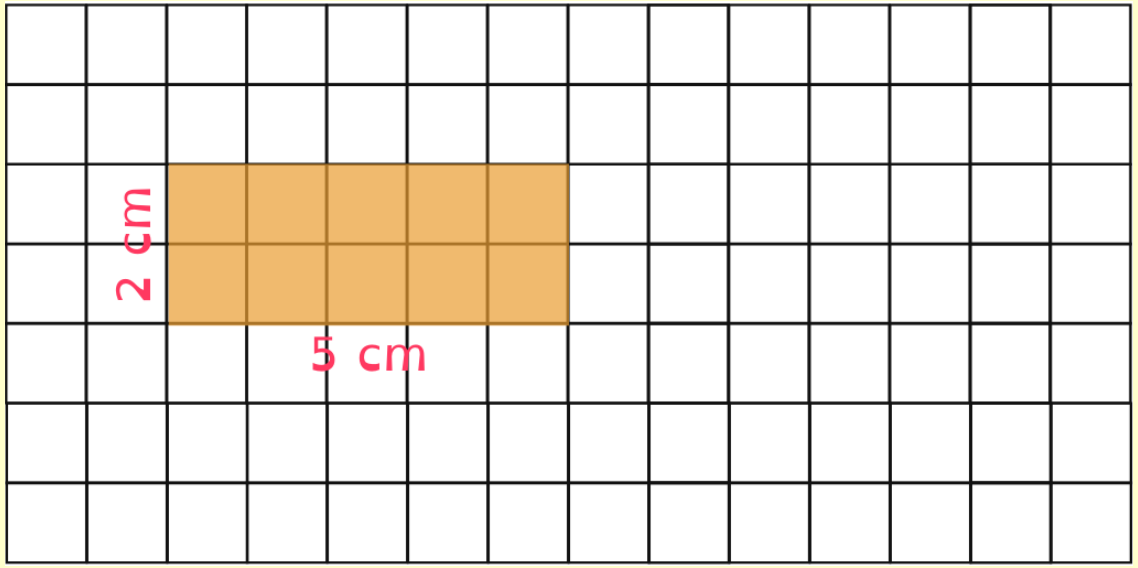
Reflective Doing

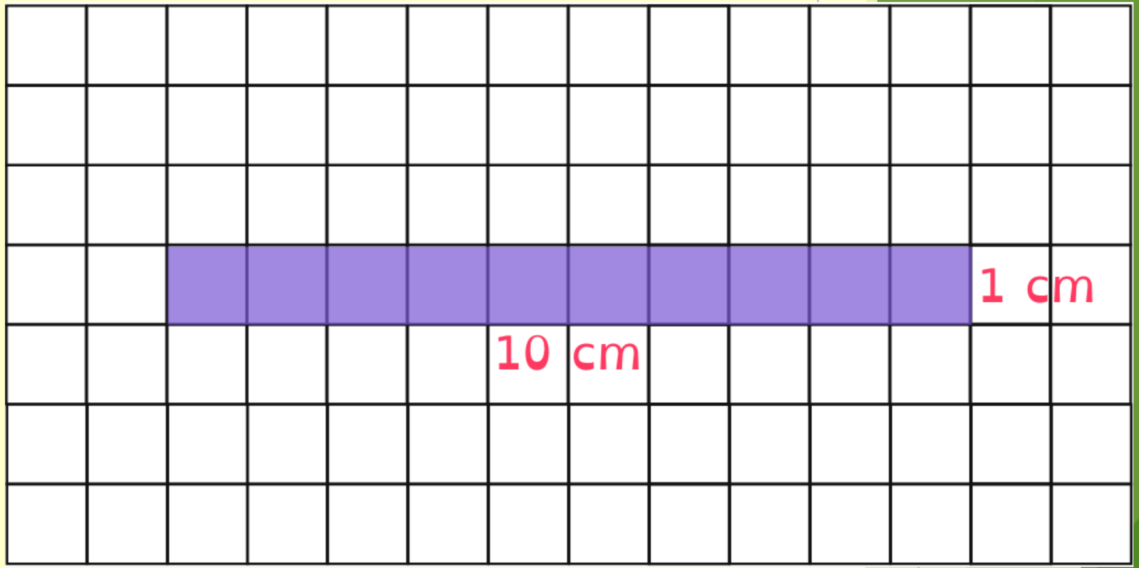
If you have access to, or are able to print squared paper (I have attached a document to Week 4), please have a go at these activities.

Draw two different rectangles that have an area of $10cm^2$, labelling side lengths.

☐ = $1\ cm^2$

Reflective Doing - ANSWERS



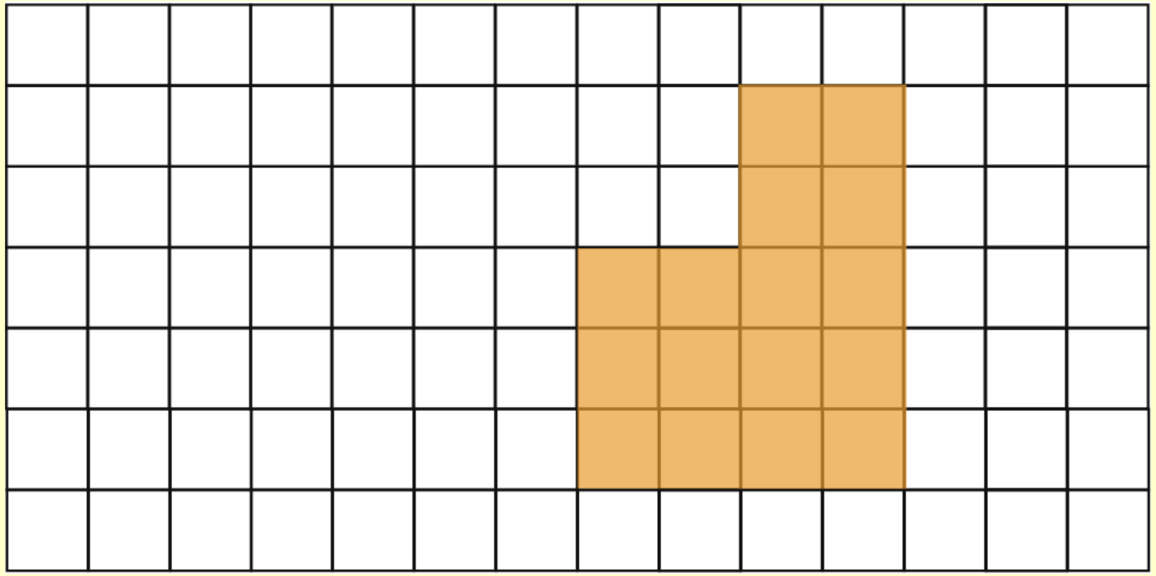


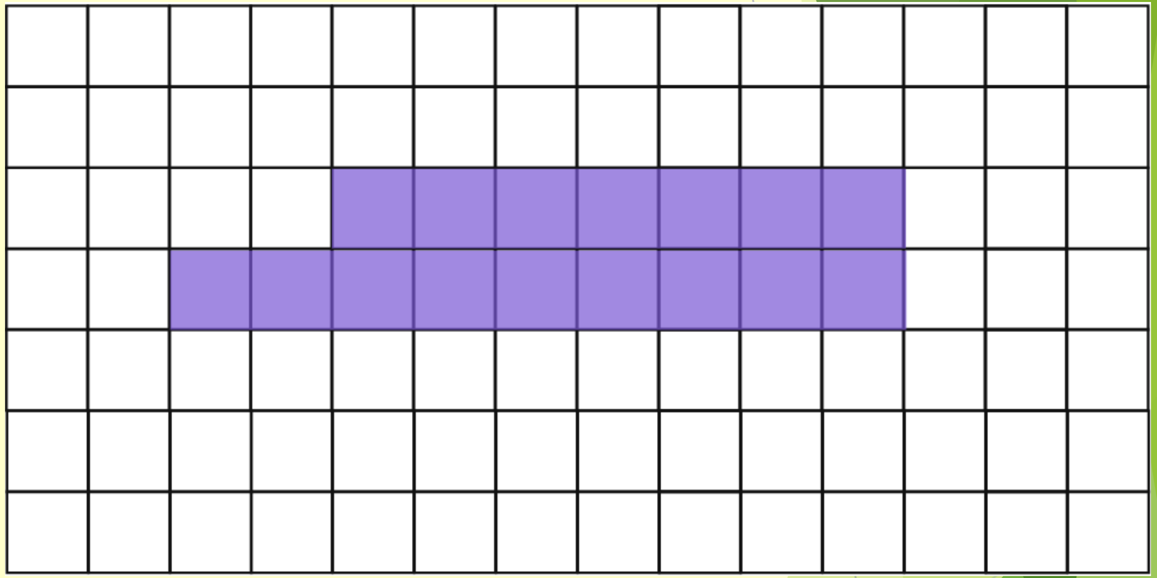
Reflective Doing

Draw two different rectangles that have an area of $16cm^2$, labelling side lengths.

□ = $1\ cm^2$

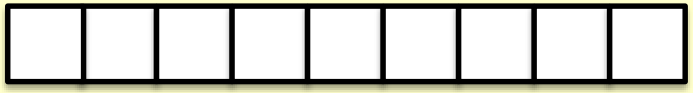
Reflective Doing - ANSWERS





Reflective Doing

What is the area of the rectangle shown below?



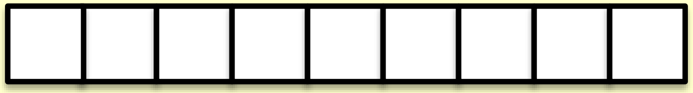
__ cm^2

□ = 1 cm^2

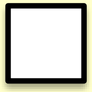
Draw a rectilinear shape with the same area:

Reflective Doing - ANSWERS

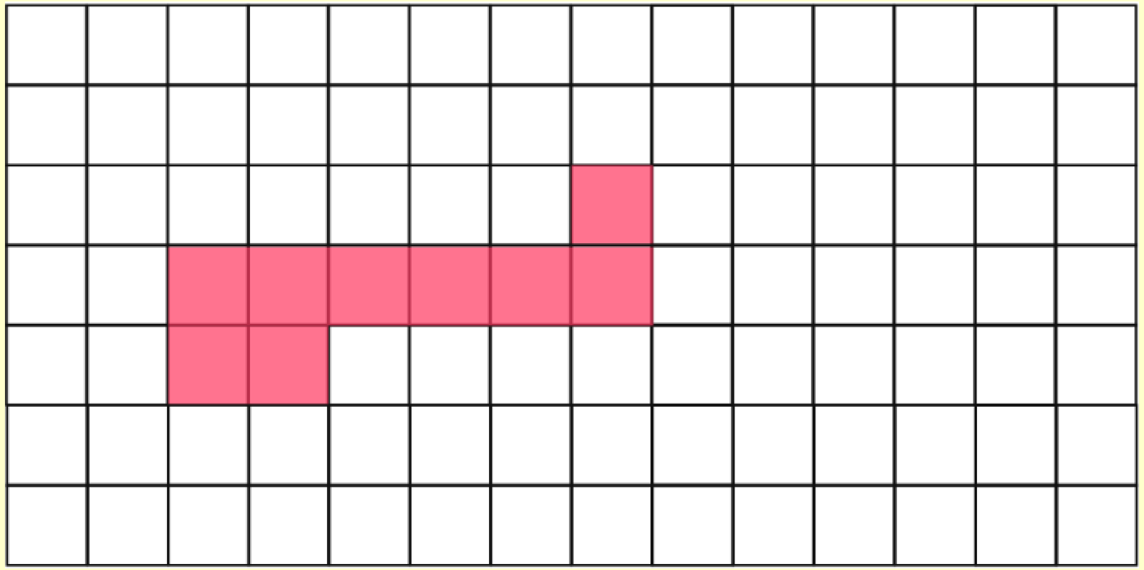
What is the area of the rectangle shown below?



9 cm^2

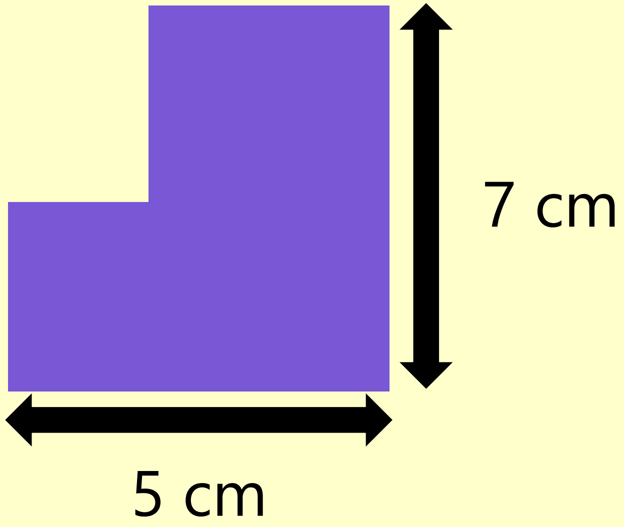
 $= 1\ cm^2$

Draw a rectilinear shape with the same area:



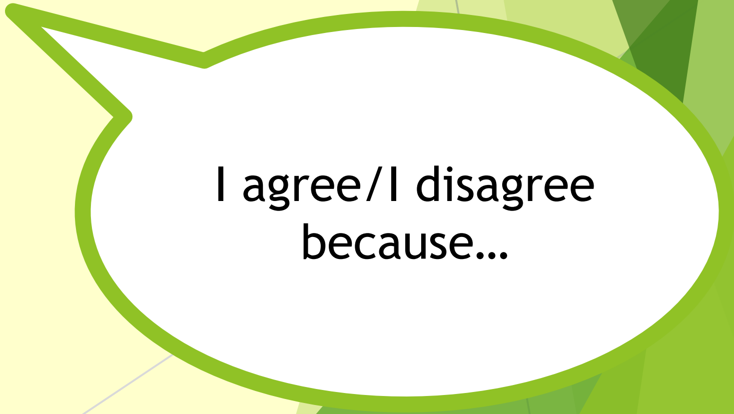
Reflective Doing

James says, “The area of the shape is $35cm^2$.”



Do you agree?

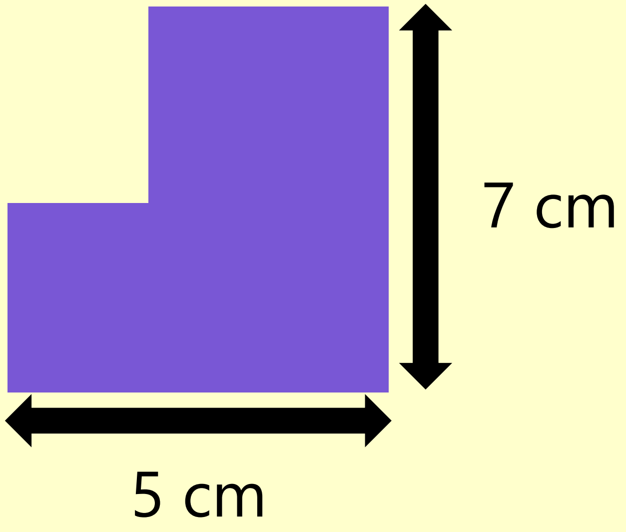
Explain your answer.



Reflective Doing - ANSWERS

No, I do not agree.

It is a rectilinear shape, not a rectangle. There are missing dimensions, so we do not know how much less than 35cm^2 the shape's area would be.



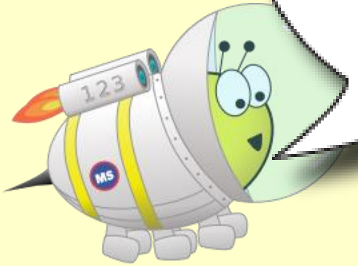
Choose your challenge

Challenges can be found on the document named ‘Maths Challenges Day 1’.

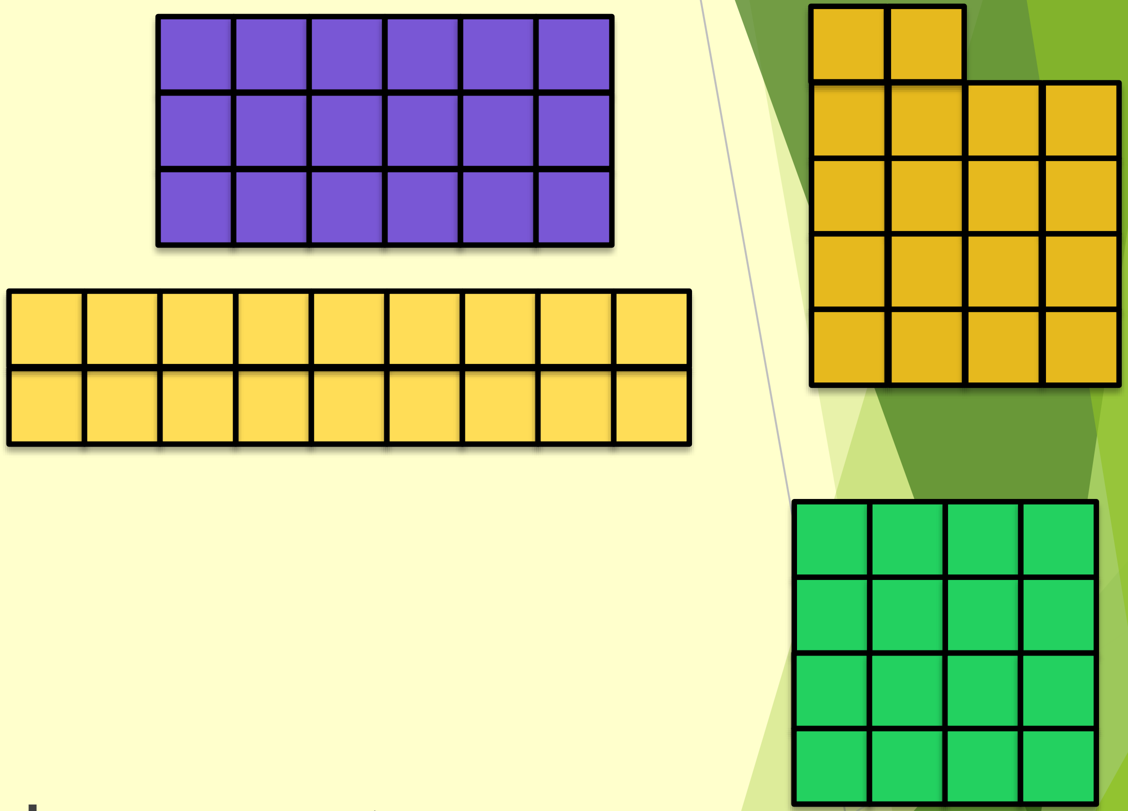
Choose an appropriate challenge OR work through green, orange and red.

Answers can be found at the bottom of the document.

Reflection Time



The orange shape doesn't belong as it is the only shape that isn't a rectangle.



Is Astrobee's statement the only correct response?

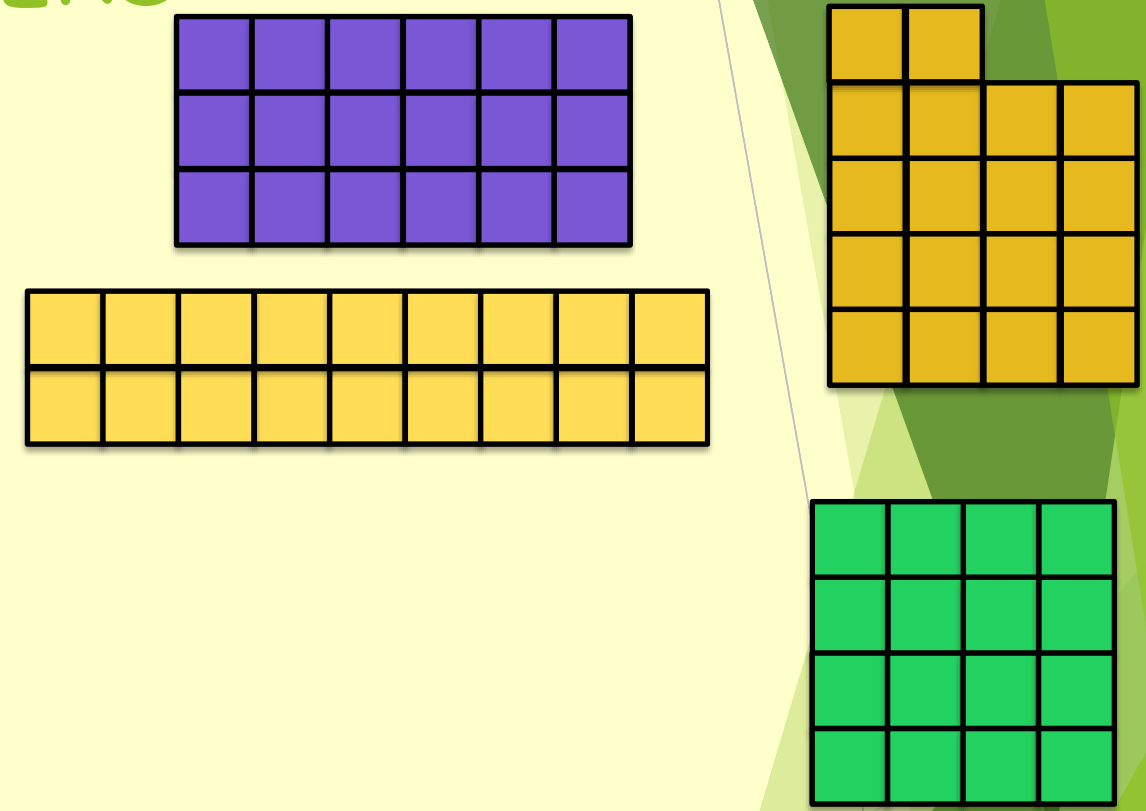
Explain your answer.

Yes/no because…

Reflection Time - ANSWERS

No, it is also true to say that the green rectangle doesn't belong.

The green rectangle has an area of $20cm^2$, unlike the other shapes as they each have an area of $18cm^2$.



Perimeter, Area and Volume

Day 2

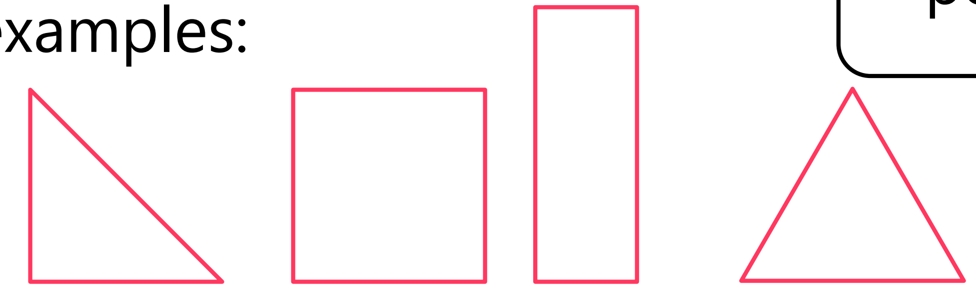
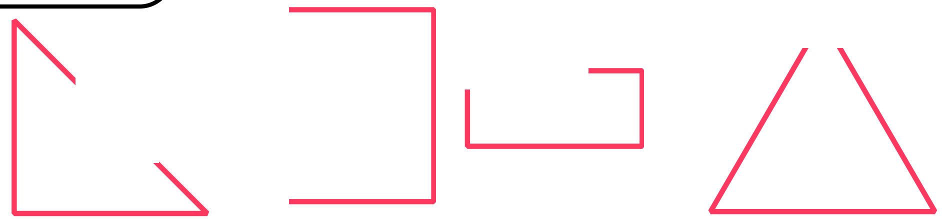
Starter

Find the word ‘perimeter’ and ‘area’ in a dictionary (or online). Then, copy and complete the table below in your book. Do one table for each word.

definition:	characteristics:
examples:	non-examples:

Perimeter/Area

Starter - ANSWERS

definition:	characteristics:
The perimeter of a shape, an object or an area of land is **the whole** of its outer edge or boundary.	The complete outer limit or line of the inside of an object shape. (cm / m / km)
examples: 	non-examples: 

perimeter

Starter - ANSWERS

definition:

The area of a shape, an object or a part of land is **the whole** amount of space it totals or covers.

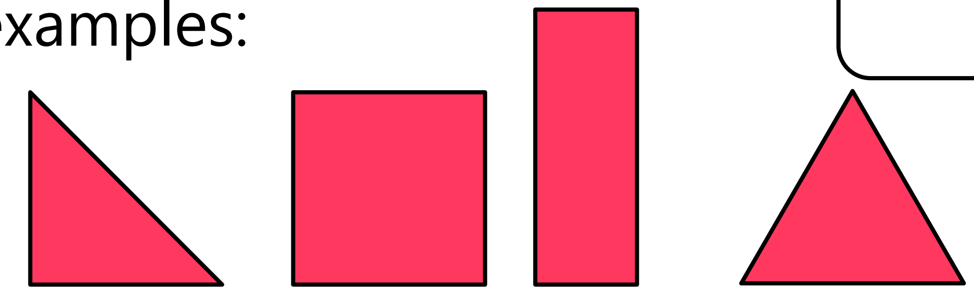
characteristics:

The complete inner space covered by the inside of an item, place or

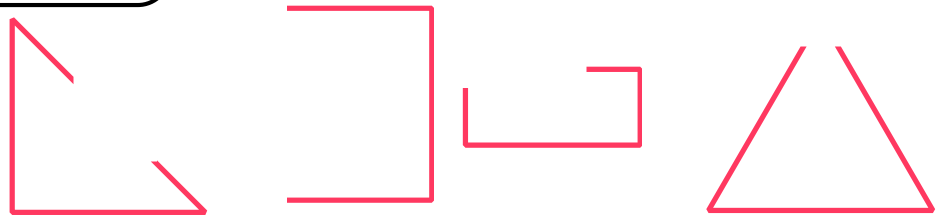
ape (cm^2 / m^2)

area

examples:



non-examples:



Date: Day 2

LO: To calculate the perimeter and area of rectangles and rectilinear shapes.

Key Vocabulary

Date: Day 2

LO: To calculate the perimeter and area of rectangles and rectilinear shapes.

Success Criteria

I can use my knowledge of formulae for calculating the areas and perimeters of rectangles and rectilinear shapes to explore the perimeters and areas of similar and non-similar rectangles and rectilinear shapes.

I can explain my reasoning.

Descriptive Teaching

What is the difference between area and perimeter?

Area is the total amount of space within a shape.

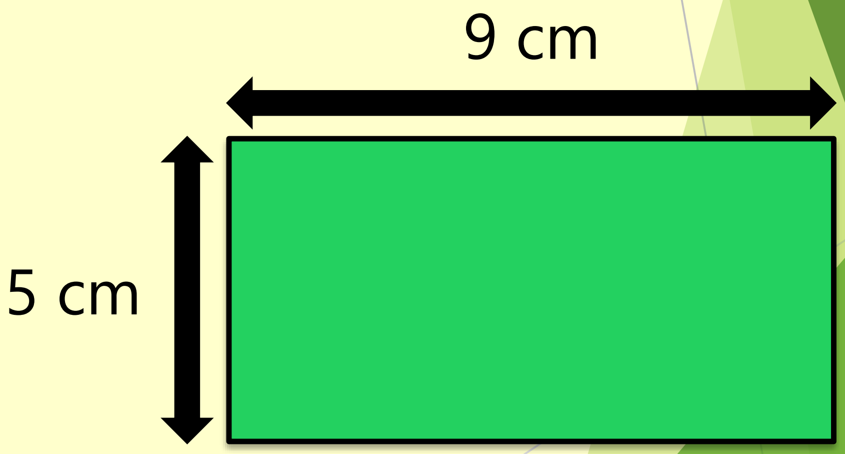
Perimeter is the total length of all a shape’s sides combined.

Descriptive Teaching

To find the area of a shape, you multiply the width by length.

$A = l \times w$

e.g. $9cm \times 5cm = 45cm^2$

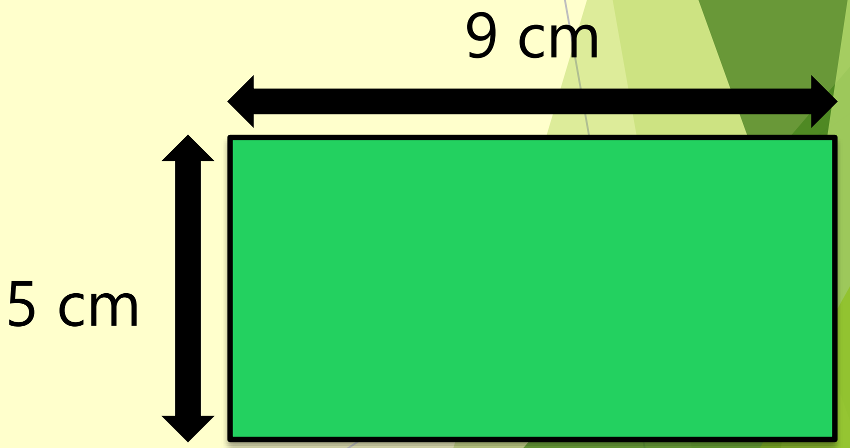


Descriptive Teaching

To find the perimeter of a shape, you find the total of all the sides.

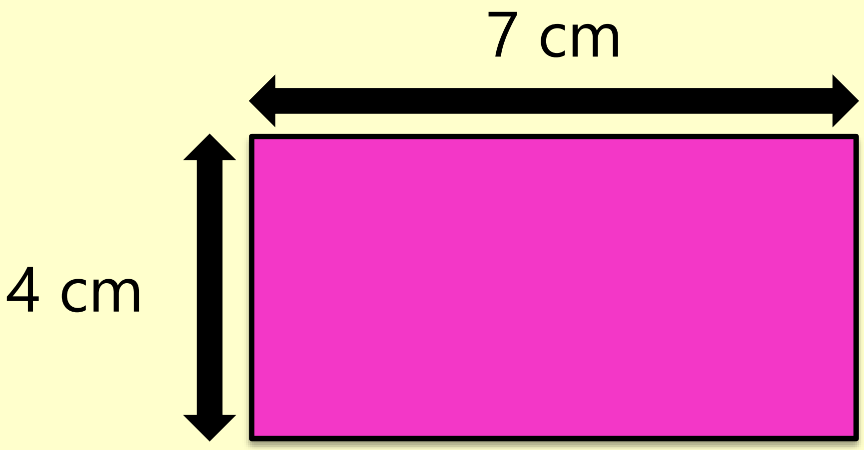
You can use the formula P = 2(l + w).

e.g. 2(9 + 5) = 14 x 2 = 28cm



Descriptive Doing

Find the area and perimeter of this shape.



Descriptive Doing - ANSWERS

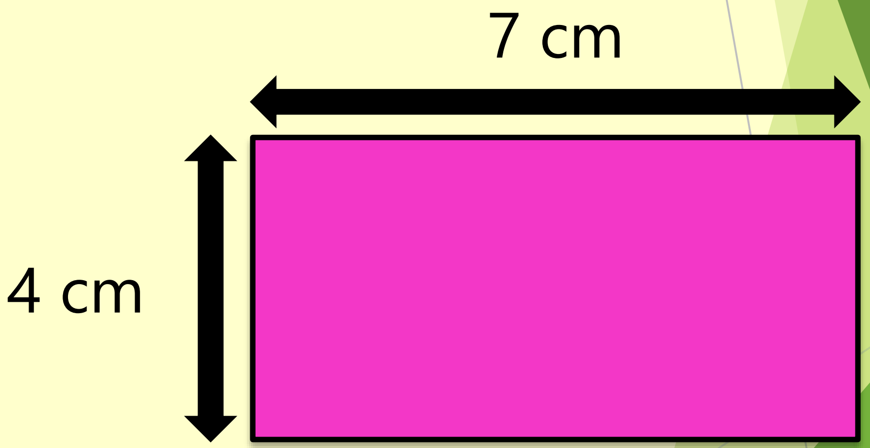
<u>Area</u>

$7cm \times 4cm = 28cm^2$

<u>Perimeter</u>

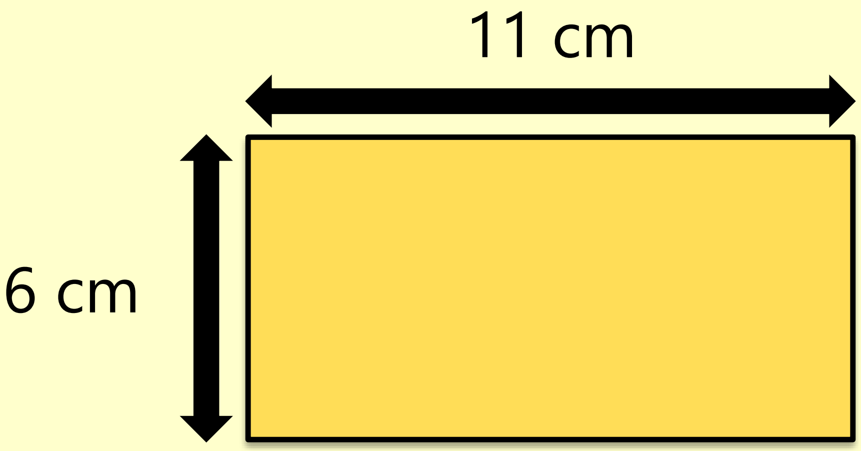
$2(7 \times 4) = 11 \times 2 = 22cm$

$4 + 4 + 7 + 7 = 22cm$



Descriptive Doing

Find the area and perimeter of this shape.



Descriptive Doing - ANSWERS

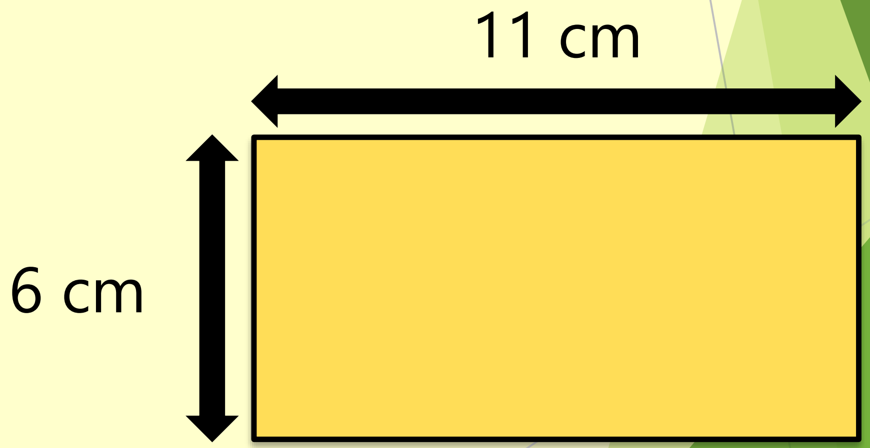
<u>Area</u>

$11cm \times 6cm = 66cm^2$

<u>Perimeter</u>

$2(11 + 6) = 17 \times 2 = 34cm$

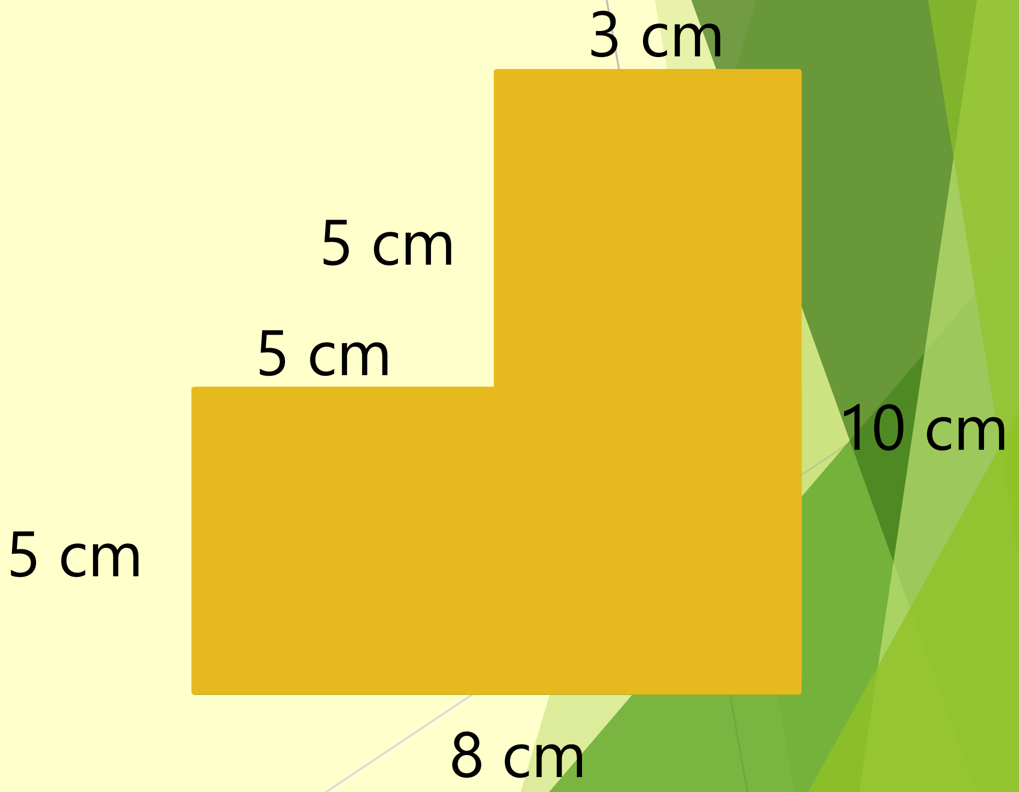
$6 + 6 + 11 + 11 = 34cm$



Descriptive Teaching

To find the perimeter of a rectilinear shape, add all the side lengths together.

e.g. 5 + 5 + 5 + 3 + 10 + 8 = 36m



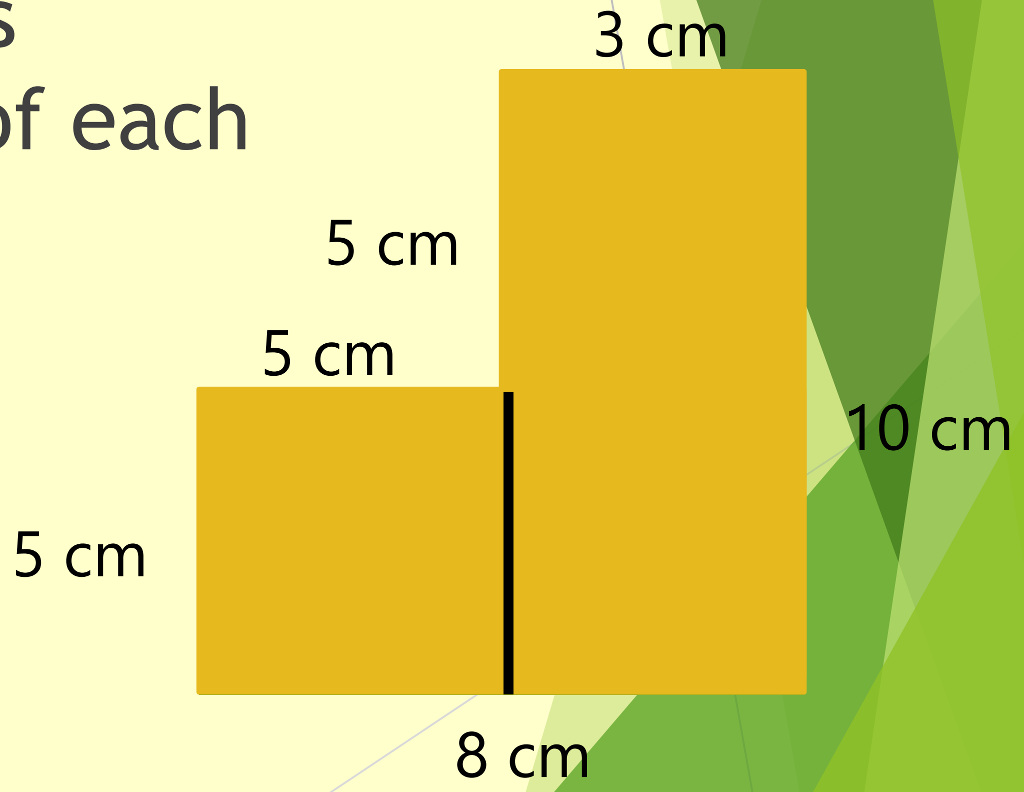
Descriptive Teaching

To find the area of a rectilinear shape, split the shape into rectangles (as shown). Then work out the area of each rectangle and add them together.

e.g. $5 \times 5 = 25cm^2$

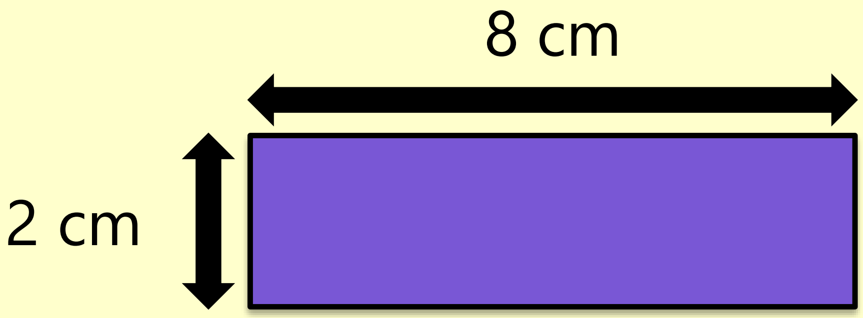
$10 \times 3 = 30cm^2$

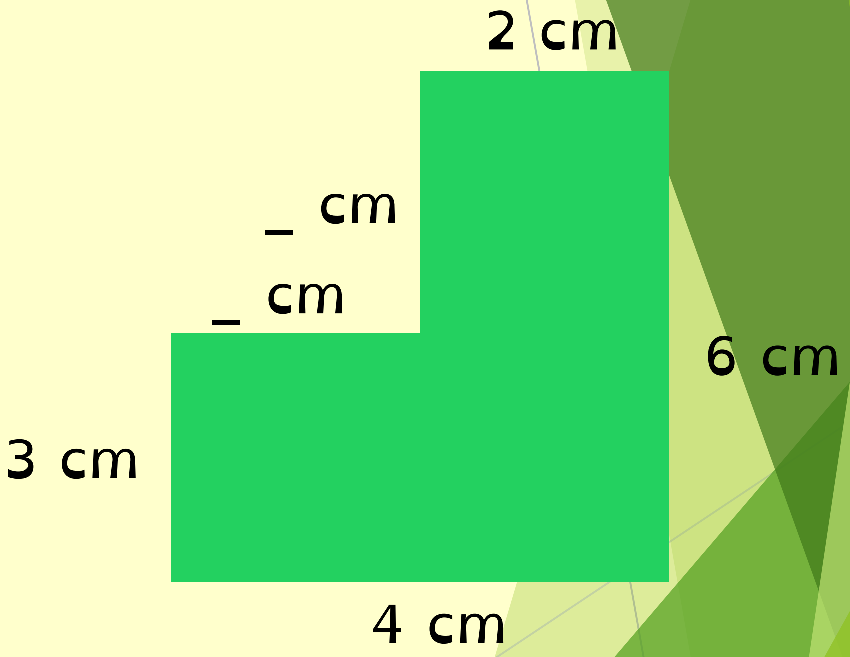
$30cm^2 + 25cm^2 = 55cm^2$



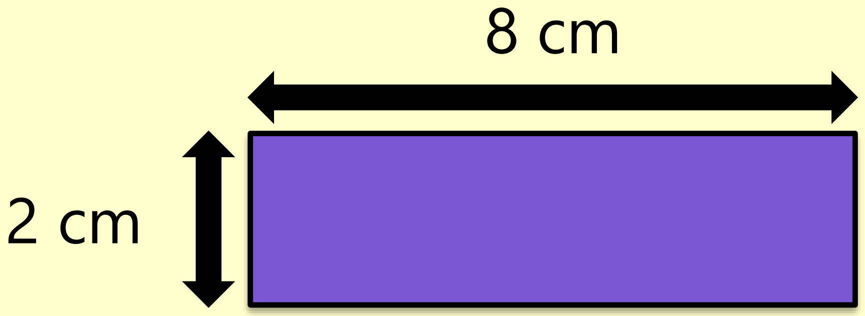
Descriptive Doing

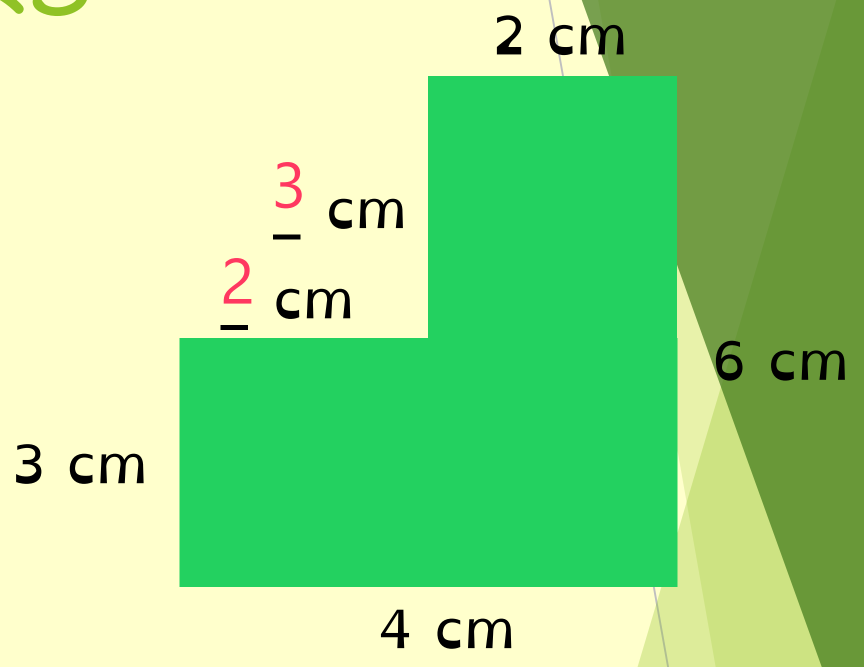
Find the areas and perimeters of the shapes.





Descriptive Doing - ANSWERS





Perimeter:
$2(8 + 2) = 2 \times 10 = 20$ cm

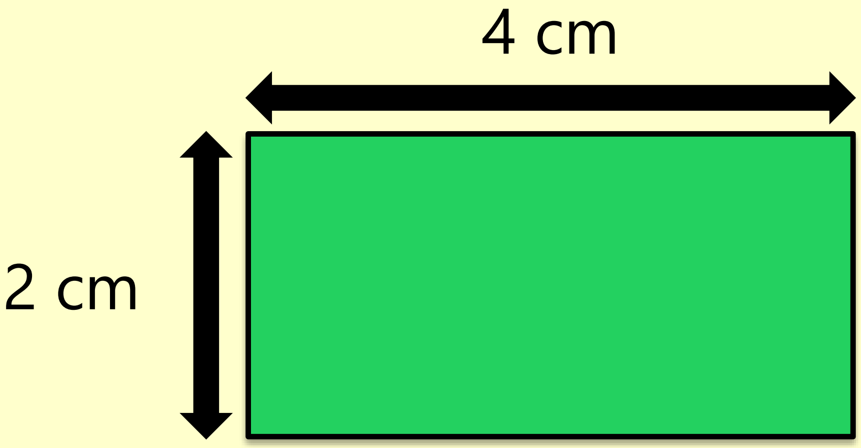
Area:
8 cm $\times 2$ cm $= 16$ cm^2

Perimeter:
$3 + 2 + 3 + 2 + 6 + 4 = 20$ cm

Area:
3×2 cm $= 6$ cm^2
2×6 cm $= 12$ cm^2
12 cm^2 + 6 cm^2 $= 18$ cm^2

Reflective Teaching

To calculate the missing value on a shape, you may need to use an inverse operation.



Area = 8 cm^2

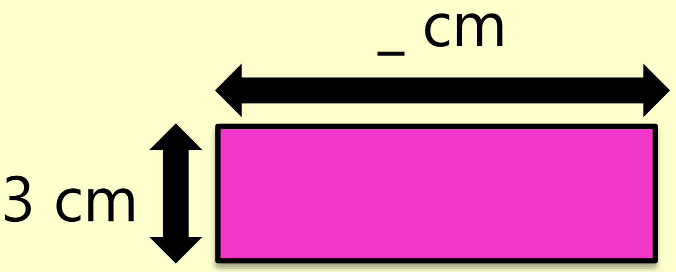
Perimeter = **12** cm

$8cm^2 \div 4cm = 2cm$

$4 + 4 + 2 + 2 = 12$

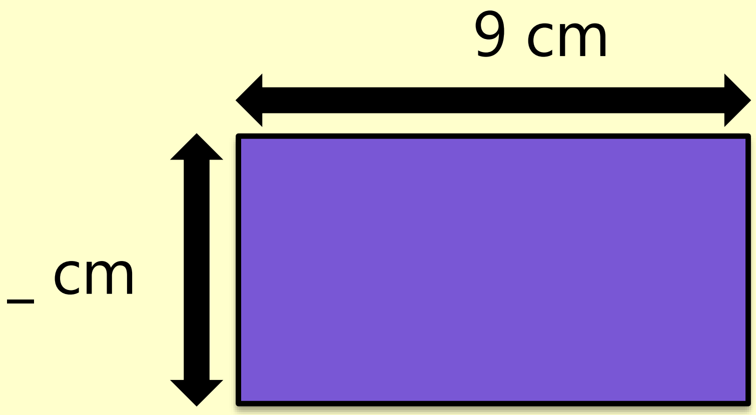
Reflective Doing

Calculate the missing values.



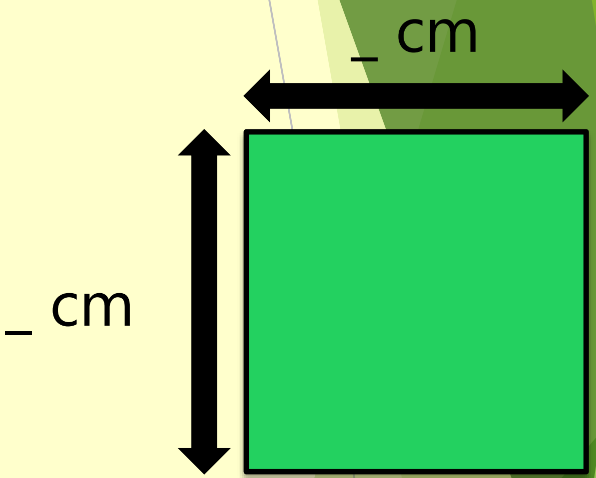
Area = 36 cm^2

Perimeter = __ cm



Area = __ cm^2

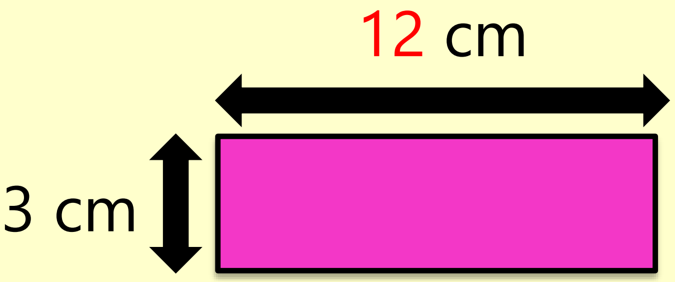
Perimeter = 28 cm



Area = __ cm^2

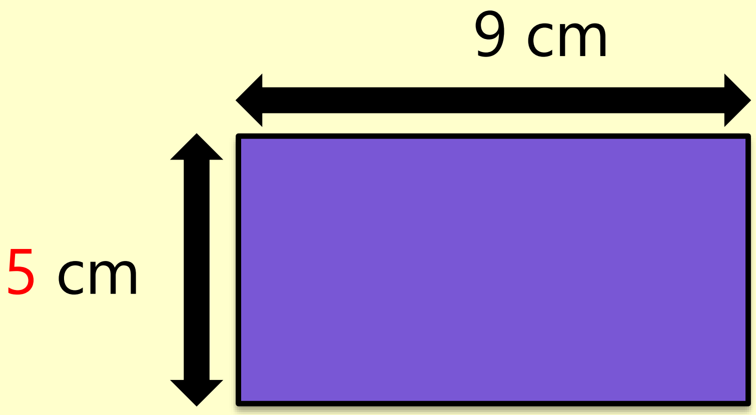
Perimeter = 32 cm

Reflective Doing - ANSWERS



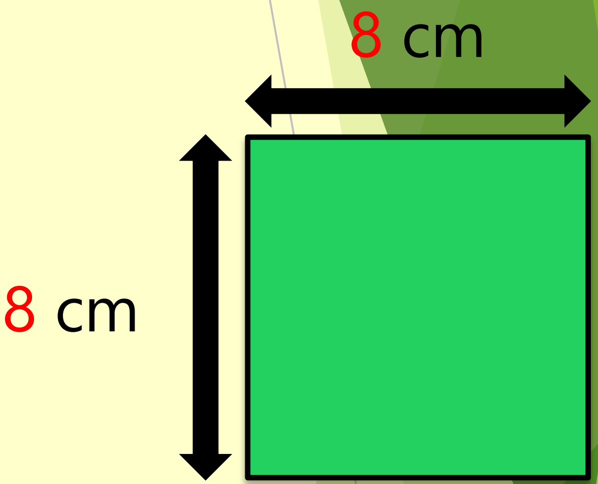
Area = 36 cm^2

Perimeter = **30** cm



Area = **45** cm^2

Perimeter = 28 cm



Area = **64** cm^2

Perimeter = 32 cm

Reflective Doing

Draw two rectilinear shapes that have an area of $48cm^2$ but have a different perimeter, stating what the perimeter is for each shape.

You will need to use a ruler for this.

Reflective Doing

□ = 1 cm^2

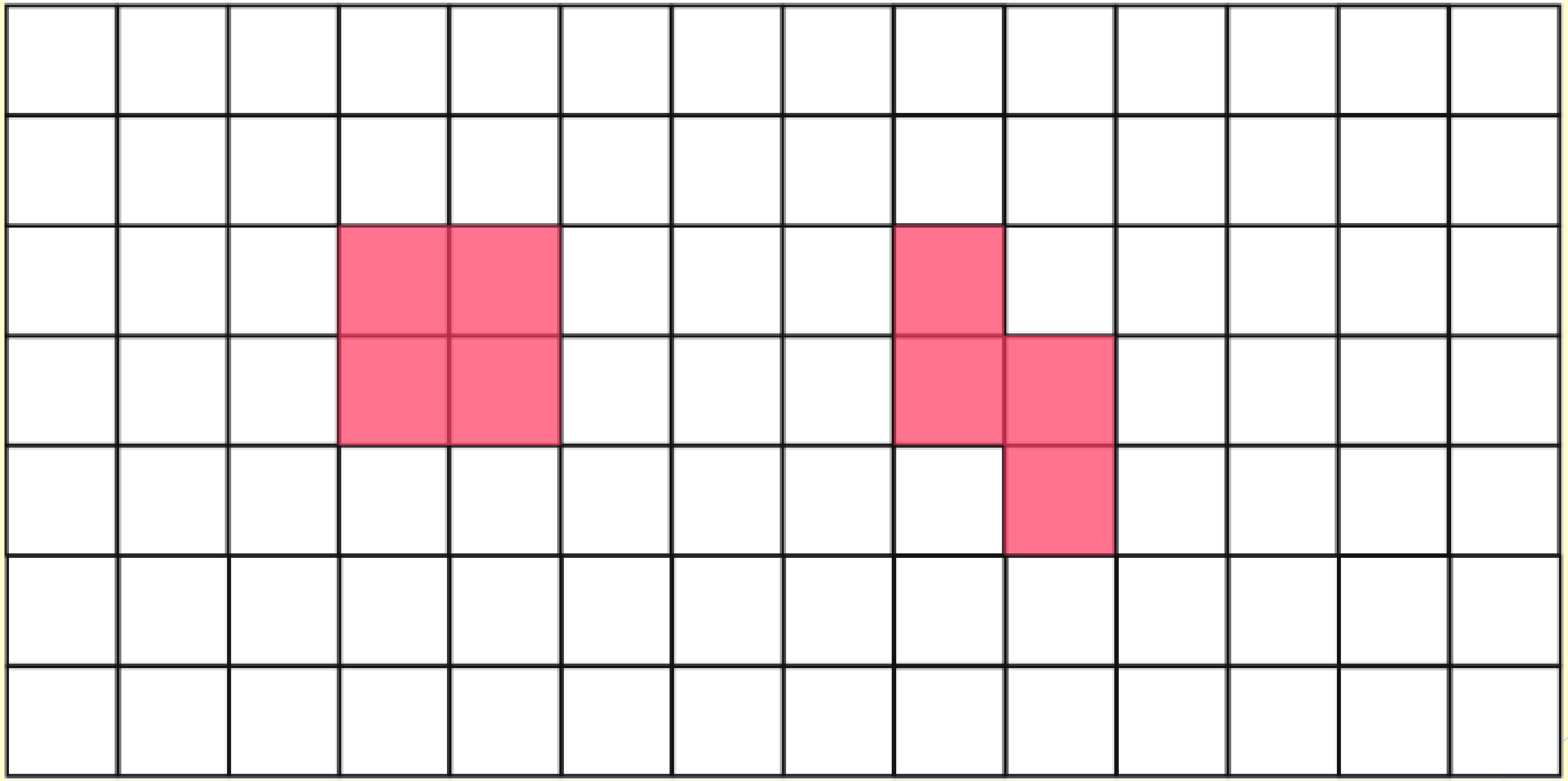
Draw two rectilinear shapes with the area $4cm^2$.

The first shape must have the smallest perimeter possible.

The second shape must have the greatest possible perimeter.

You will need to use a ruler for this.

Reflective Doing - ANSWERS



Reflective Doing

Farmer Sam has 60m of chicken wire.

What is the largest enclosure she can create for her chickens?

What is the smallest enclosure she can create for her chickens?

All values must be whole numbers.

Reflective Doing - ANSWERS

The largest enclosure possible is 225m².

A 15 by 15m square enclosure.

The smallest possible enclosure is 29m².

A rectangular run of 29m by 1m.

Reflective Doing

James says, “Two rectangles can share the same area, but have different perimeters.”

Ruth says, “Two rectangles can share the same perimeter, but have different areas.”

Who is correct?

Explain your answer.

Ruth/James/They both are correct because…

Reflective Doing - ANSWERS

They are both correct.

For example, a 4cm x 9cm rectangle has an area of 36cm^2 and a perimeter of 26cm. While a 6cm square also has an area of 36cm^2 and a perimeter of 24cm.

Similarly, a 1cm x 11cm rectangle has a perimeter of 24cm and an area of 11cm^2. While a 2cm x 10cm rectangle has a perimeter of 24cm and an area of 20cm^2.

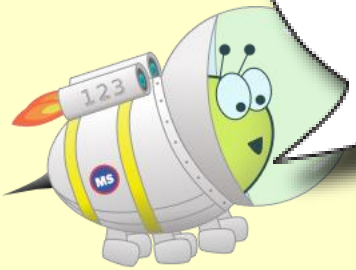
Choose your challenge

Challenges can be found on the document named ‘Maths Challenges Day 2’.

Choose an appropriate challenge OR work through green, orange and red.

Answers can be found at the bottom of the document.

Reflection Time



If a shape has a greater perimeter than another shape, then it has a greater area too.

The statement is ___ true because…

Is Astrobee's statement sometimes, always or never true?

Provide examples to explain your answer.

Reflection Time - ANSWERS

Astrobee's statement is only sometimes true. E.g. a square with a perimeter of 64cm has an area of 32cm².

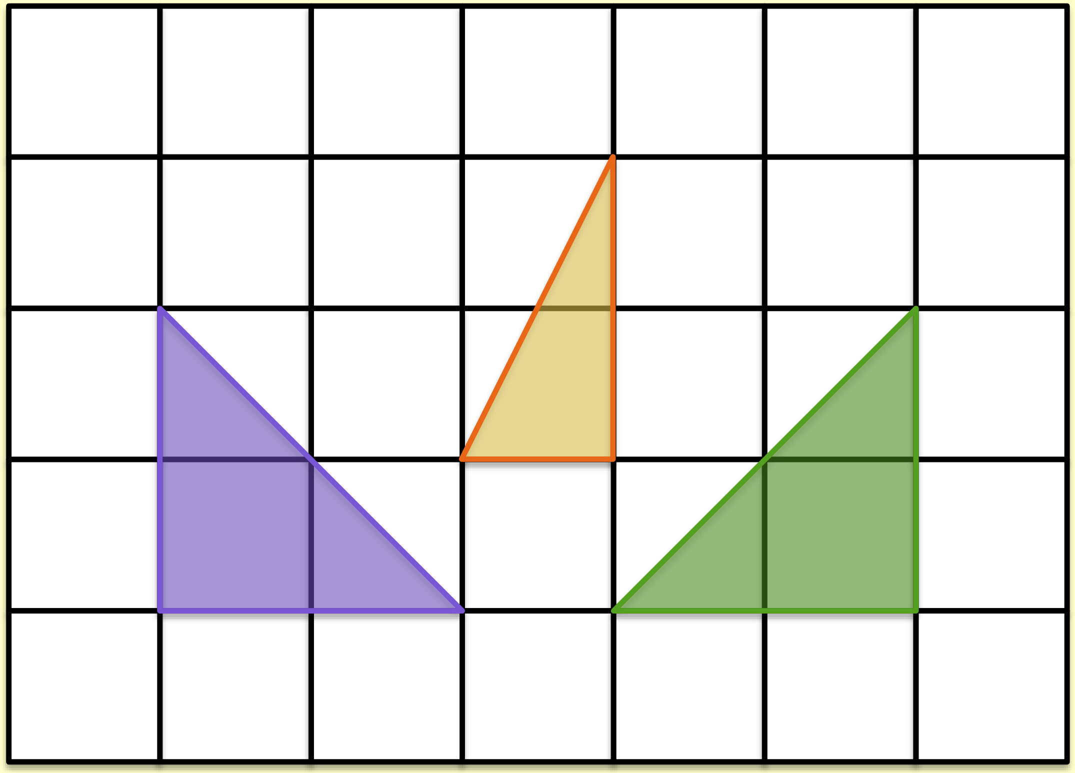
However, a 1cm by 17cm rectangle has a perimeter of 36cm but an area of only 17cm².

Perimeter, Area and Volume

Day 3

Starter

Which one doesn’t belong? Explain your answer.



Starter - ANSWERS

The yellow triangle doesn't belong, as its area is $1cm^2$.

The other triangles are $2cm^2$.

Date: Day 3

LO: To calculate the area of a triangle.

Key Vocabulary

Date: Day 3

LO: To calculate the area of a triangle.

Success Criteria

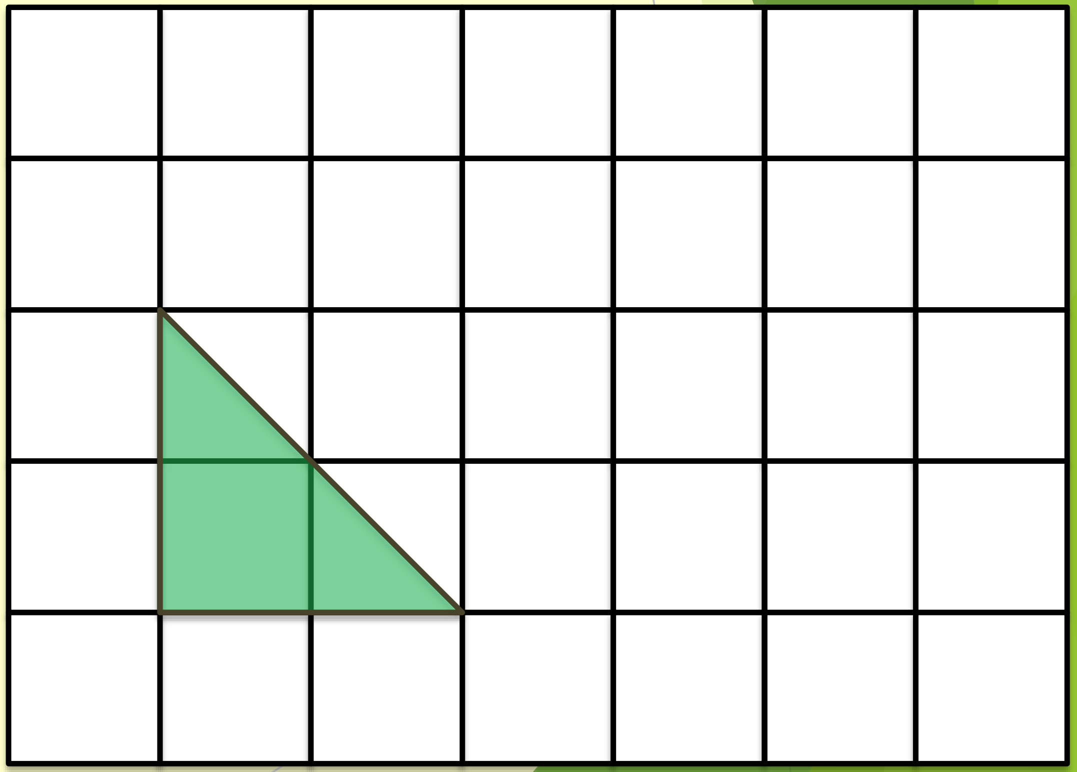
I can find the area of triangles by counting squares in a 1cm grid.

I can explain my reasoning.

Descriptive Teaching

You can find the area of a triangle by counting the squares.

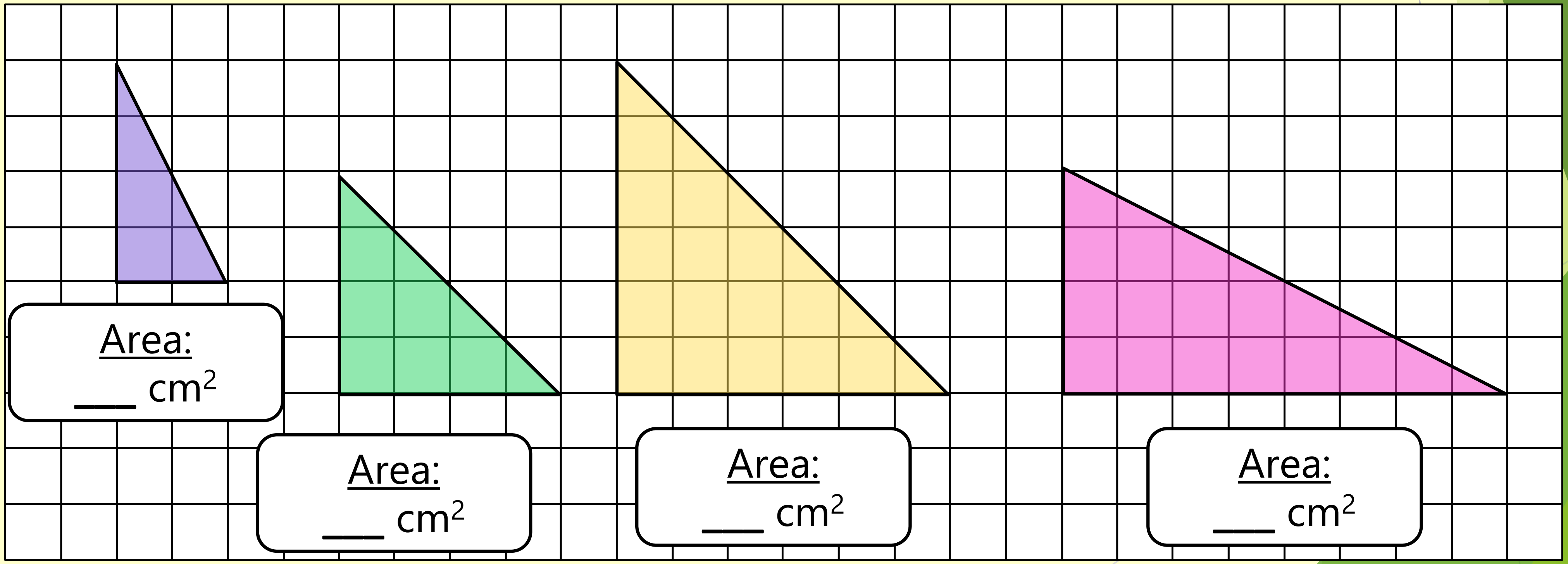
This triangle has one whole square and two half squares. Therefore the area if $2cm^2$.



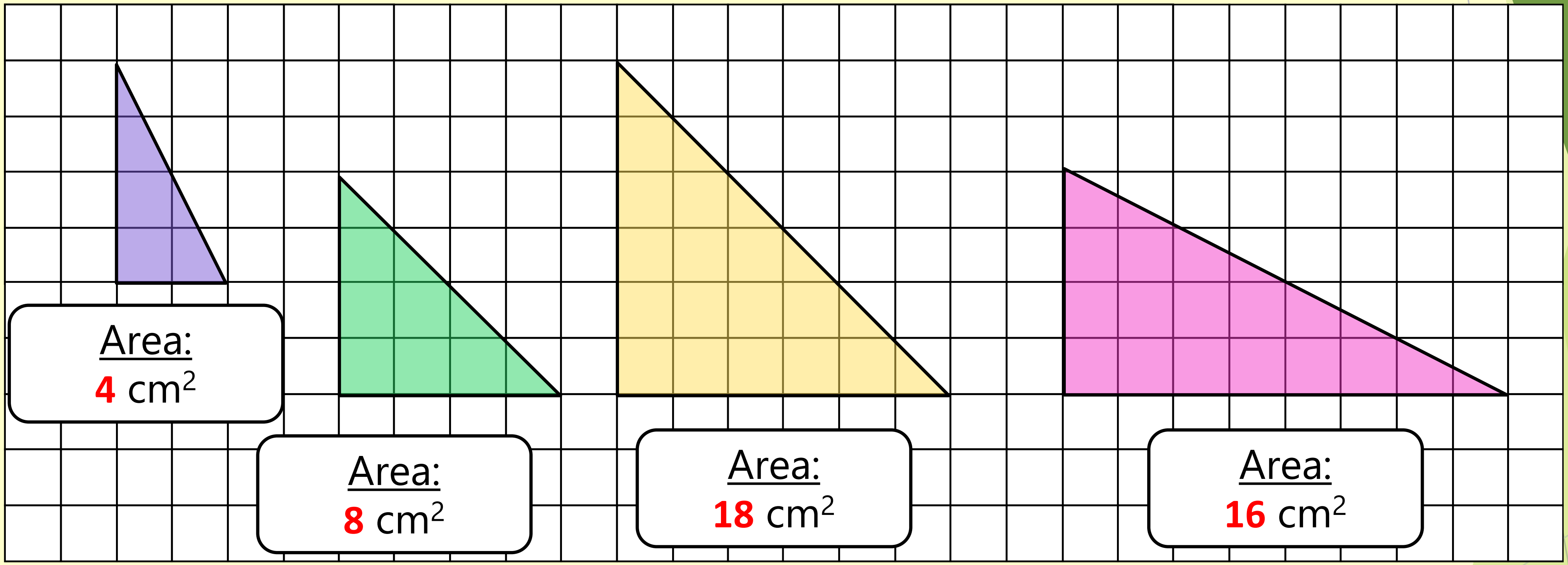
Descriptive Doing

□ = 1 cm^2

Calculate the area of the right-angled triangles.



Descriptive Doing - ANSWERS

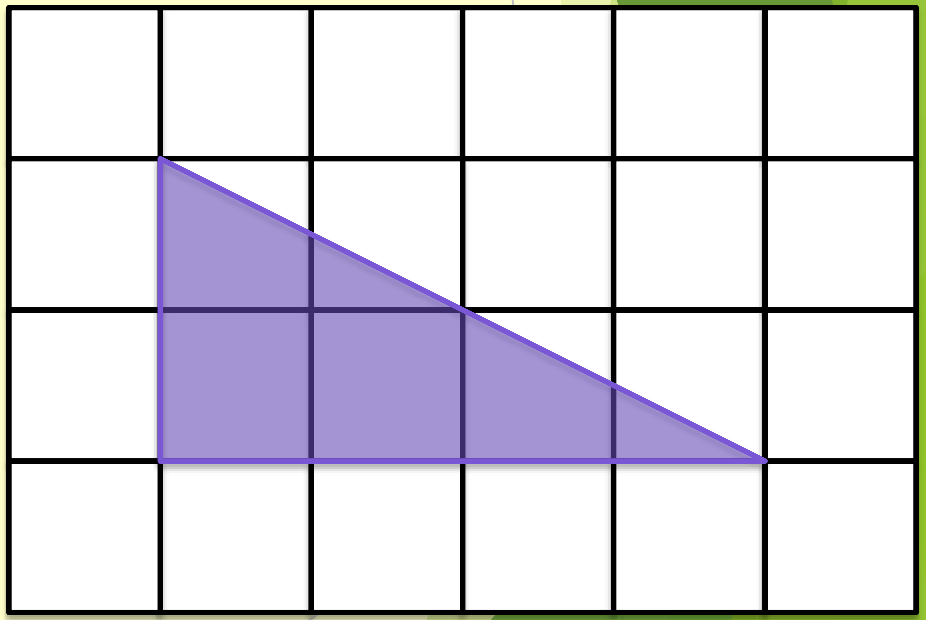


Reflective Doing

James says, “The triangle below is $6cm^2$.”

What has James done wrong?

Explain your answer.

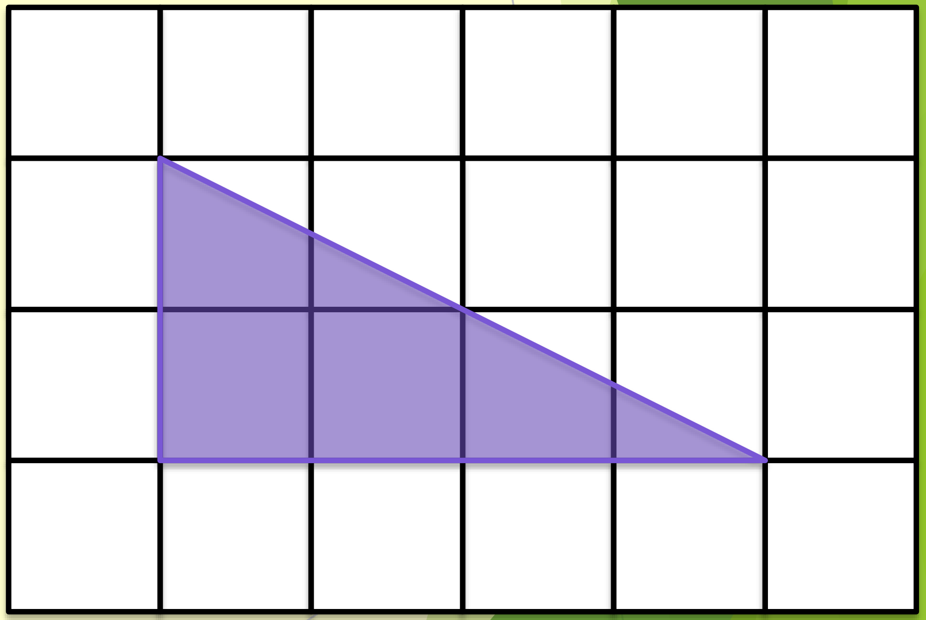


James has…

Reflective Doing - ANSWERS

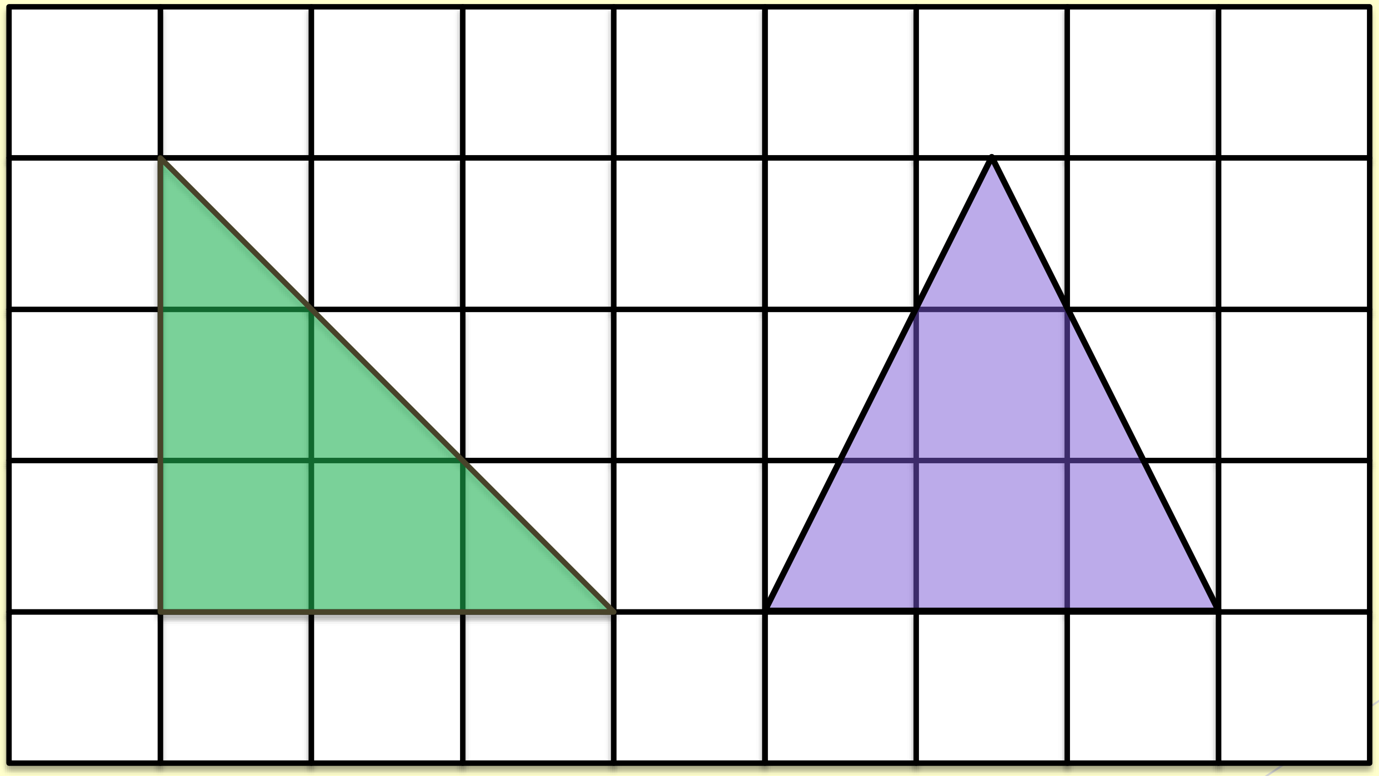
James has counted each part squares as whole squares. The triangle is made from two whole squares and four part squares.

Its area is $4cm^2$.



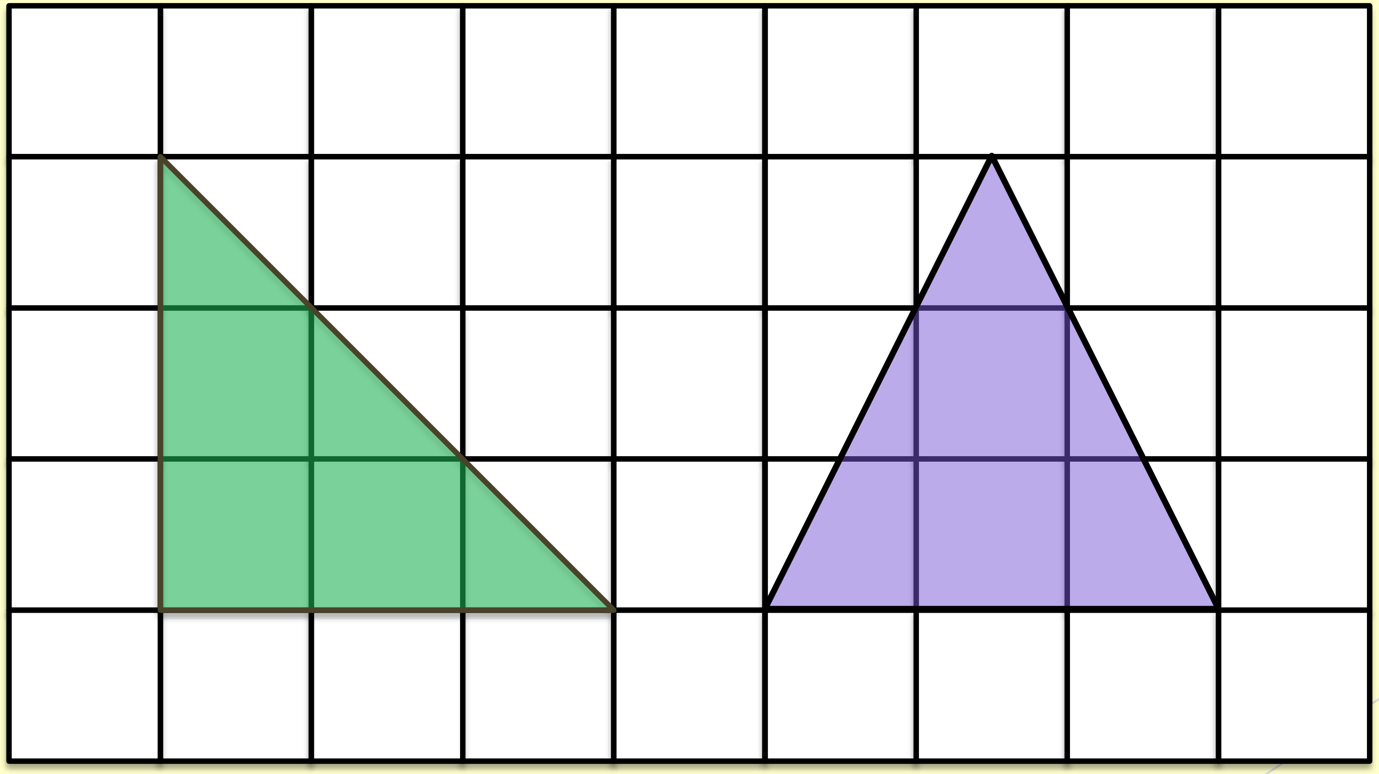
Reflective Doing

Count the squares for the two triangles below. What's the same? What's different?



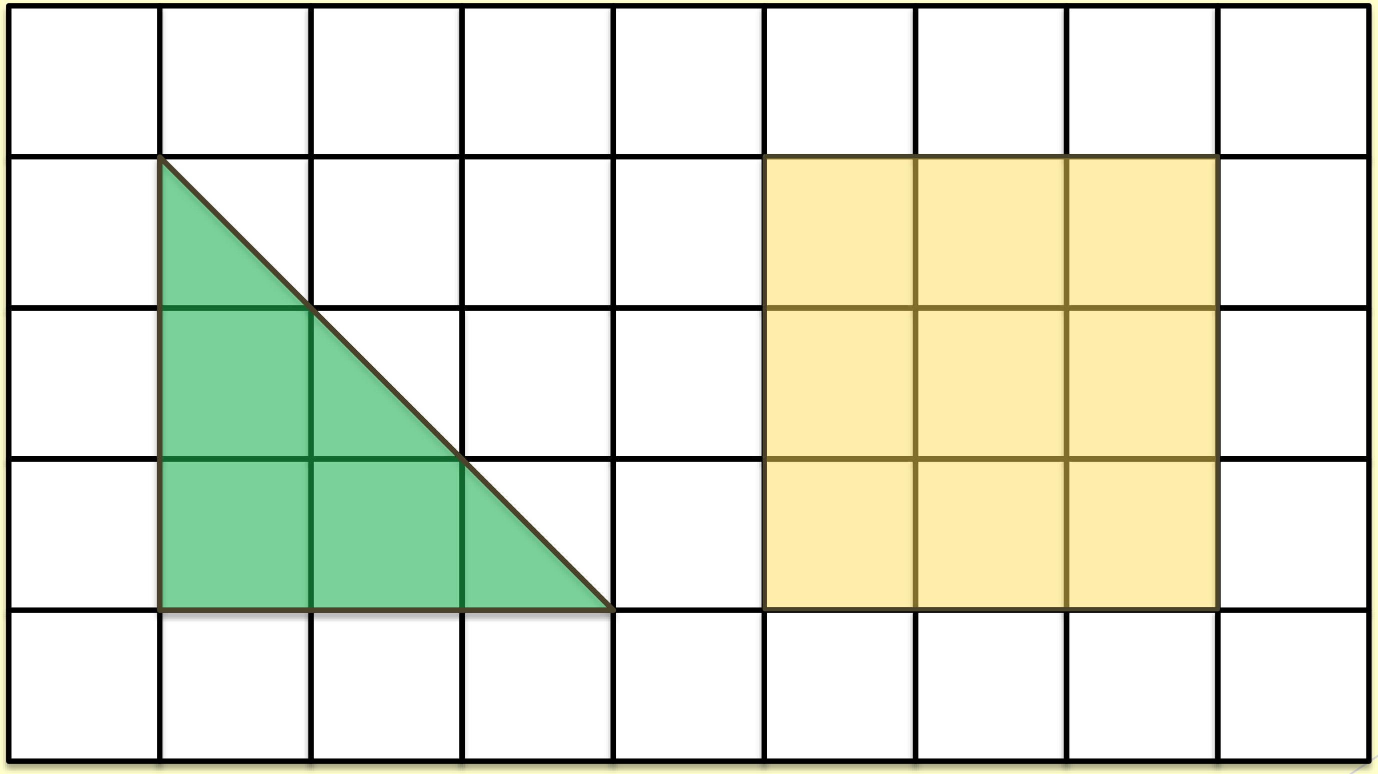
Reflective Doing - ANSWERS

Different types of triangles, both have the same area, 4.5cm^2.



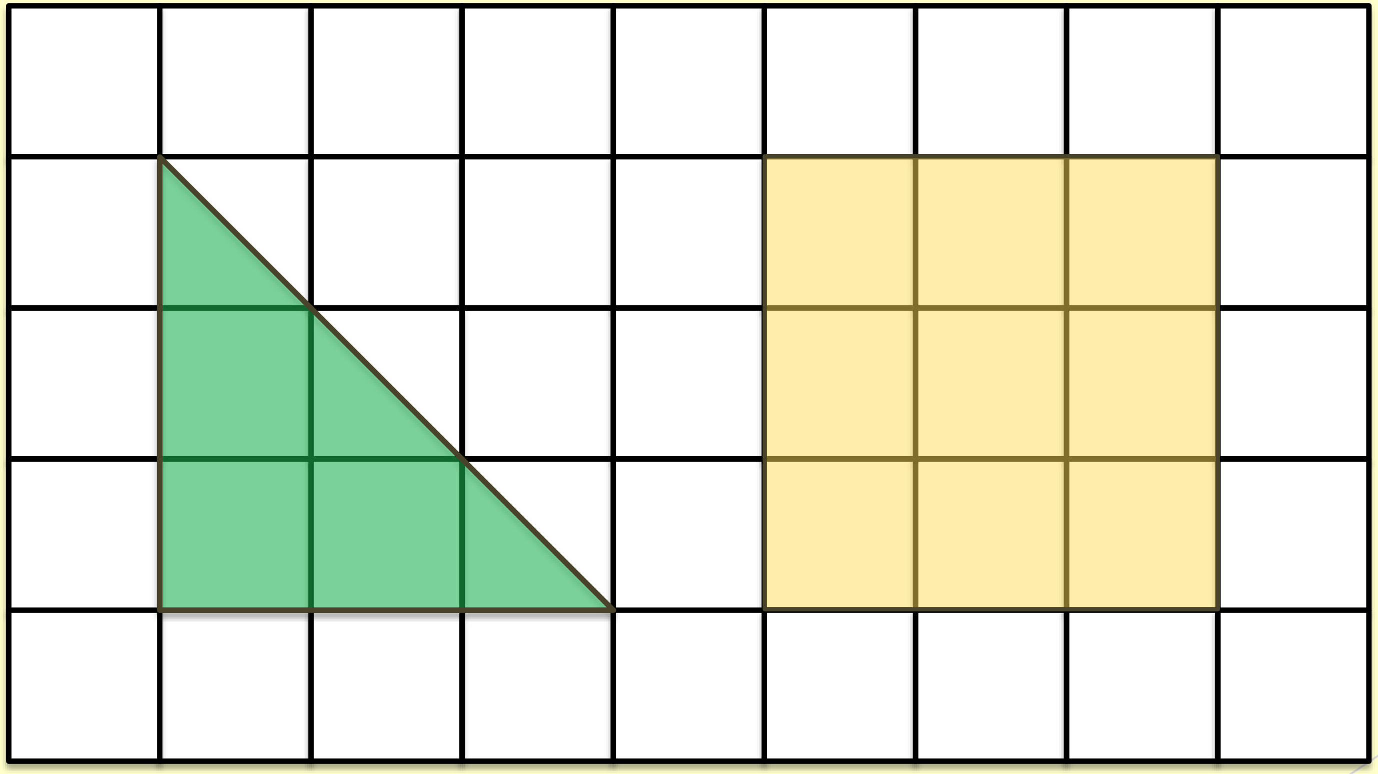
Reflective Doing

Count the squares for the two shapes below. What's the same? What's different?



Reflective Doing - ANSWERS

The triangle covers half the space the square does. (Same height and width).



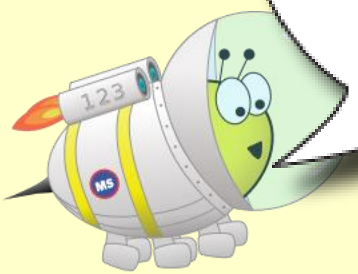
Choose your challenge

Challenges can be found on the document named ‘Maths Challenges Day 3’.

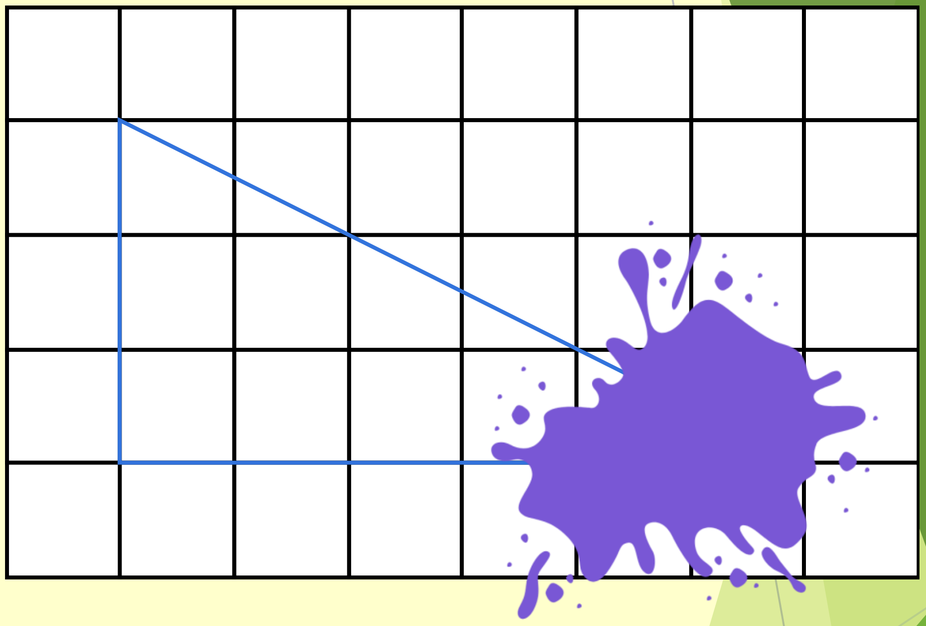
Choose an appropriate challenge OR work through green, orange and red.

Answers can be found at the bottom of the document.

Reflection Time



The area of the triangle is 8 cm^2.

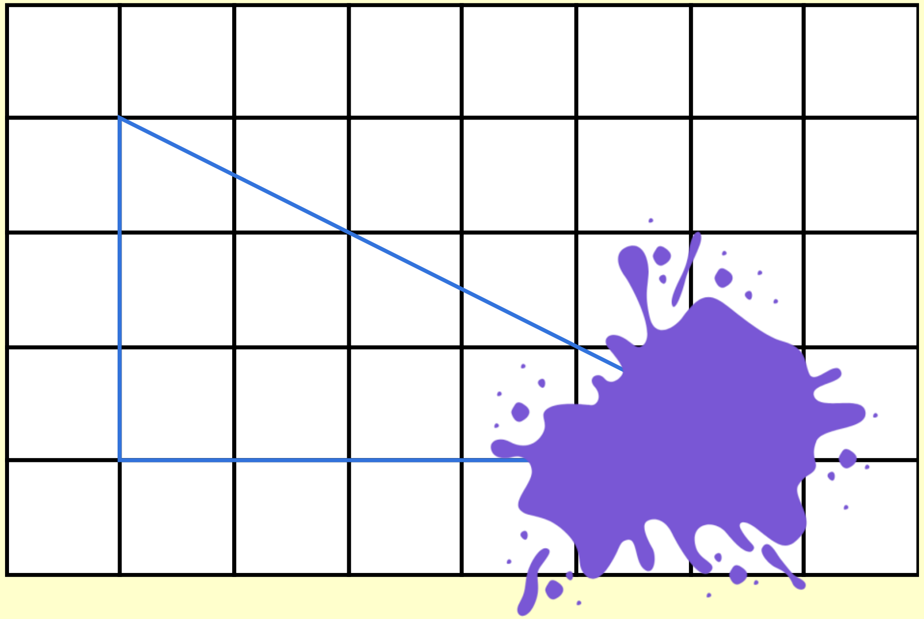


Do you agree?
Explain your answer.

I agree/I disagree because…

Reflection Time - ANSWERS

No, 8cm^2 can be counted before the splat. However, if the triangle is drawn to completion beneath the splat, then the triangle will have a total area of 9cm^2.

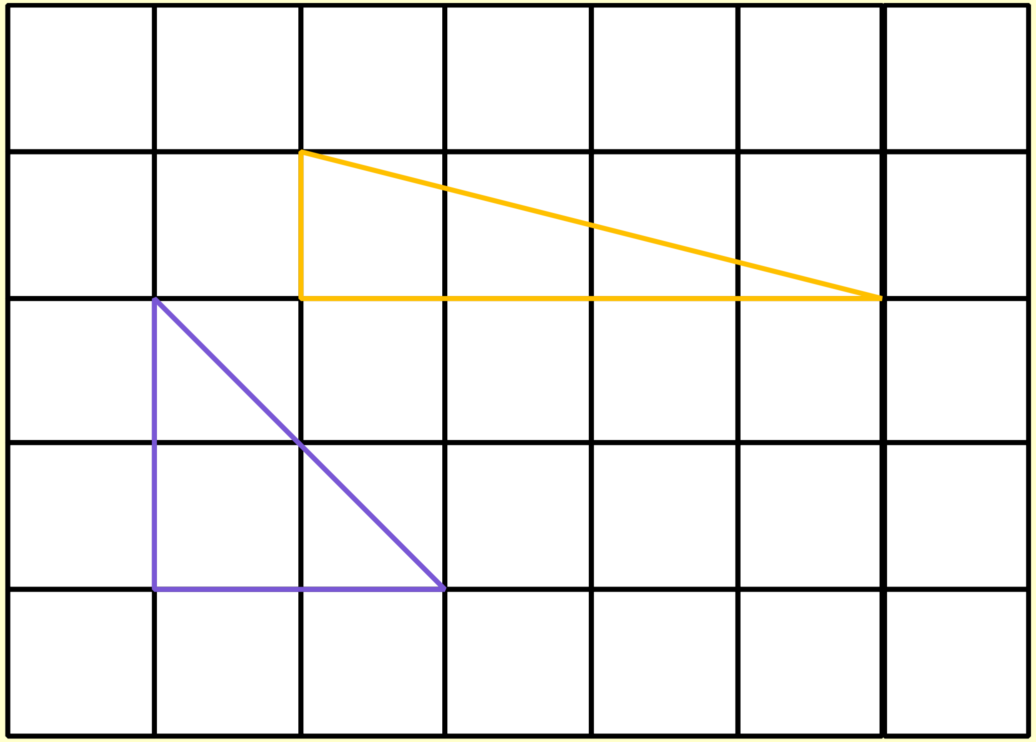


Perimeter, Area and Volume

Day 4

Starter

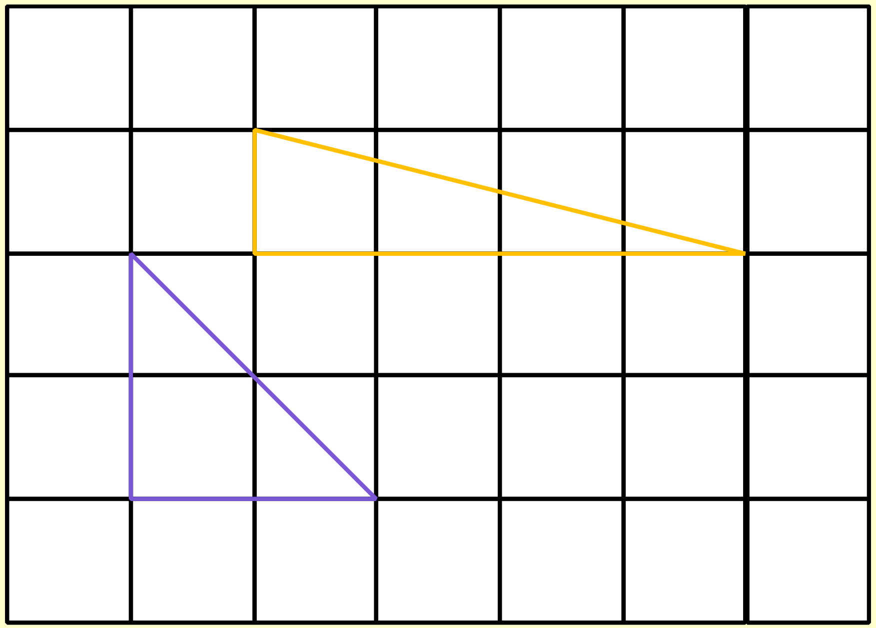
What’s the same? What’s different?



Explain your answer.

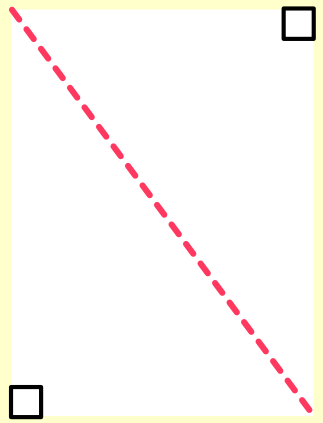
Starter - ANSWERS

The yellow triangle is 1cm tall and 4cm wide and the purple triangle is 2cm tall and 2cm wide, but both share the same area, $2cm^2$.



Starter

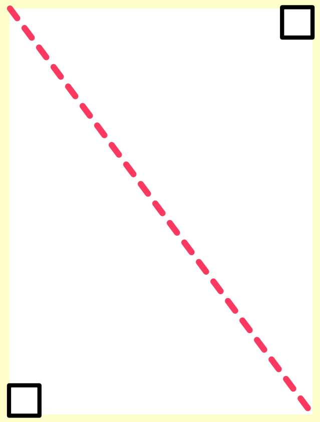
Using a rectangular piece of paper, discuss how right-angled triangles can be made.



How might we calculate the area of a right-angled triangle?

Starter - ANSWERS

Find the area of the rectangle, then half the result.



Date: Day 4

LO: To calculate the area of a triangle.

Key Vocabulary

Date: Day 4

LO: To calculate the area of a triangle.

Success Criteria

I can use my knowledge of finding the area of a triangle using a grid to calculate the area of right-angled triangles.

I can explain my reasoning.

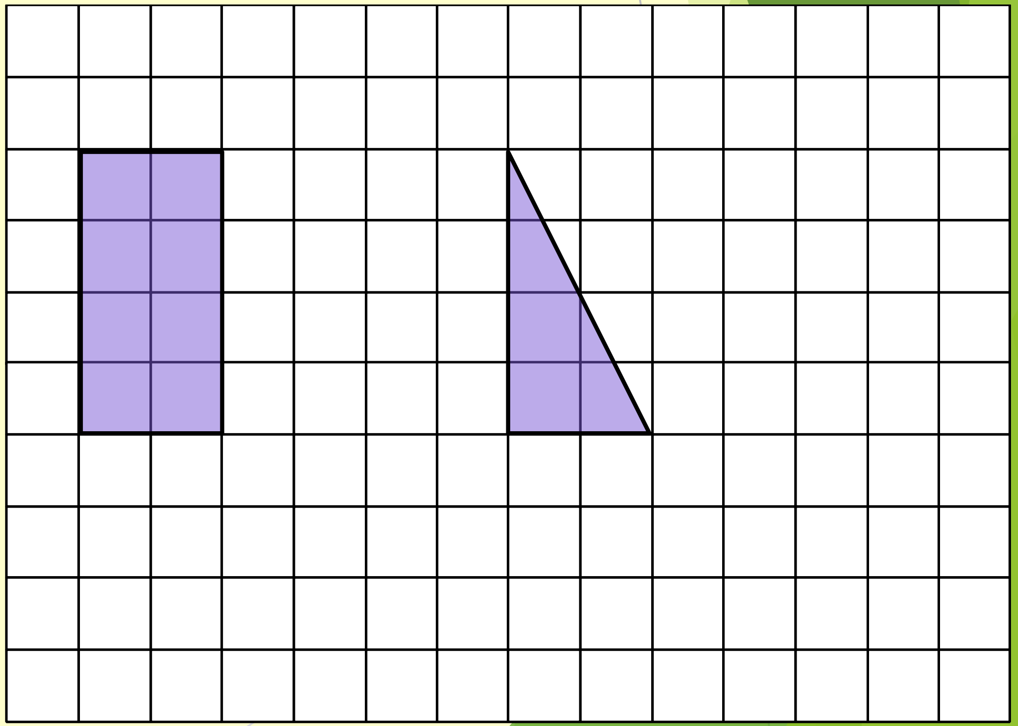
Descriptive Teaching

To find the area of a right-angled triangle, first find the area of the rectangle, then half it.

The area of the rectangle is $8cm^2$.

$8cm^2 \div 2 = 4cm^2$.

Therefore, the area of the triangle is $4cm^2$.

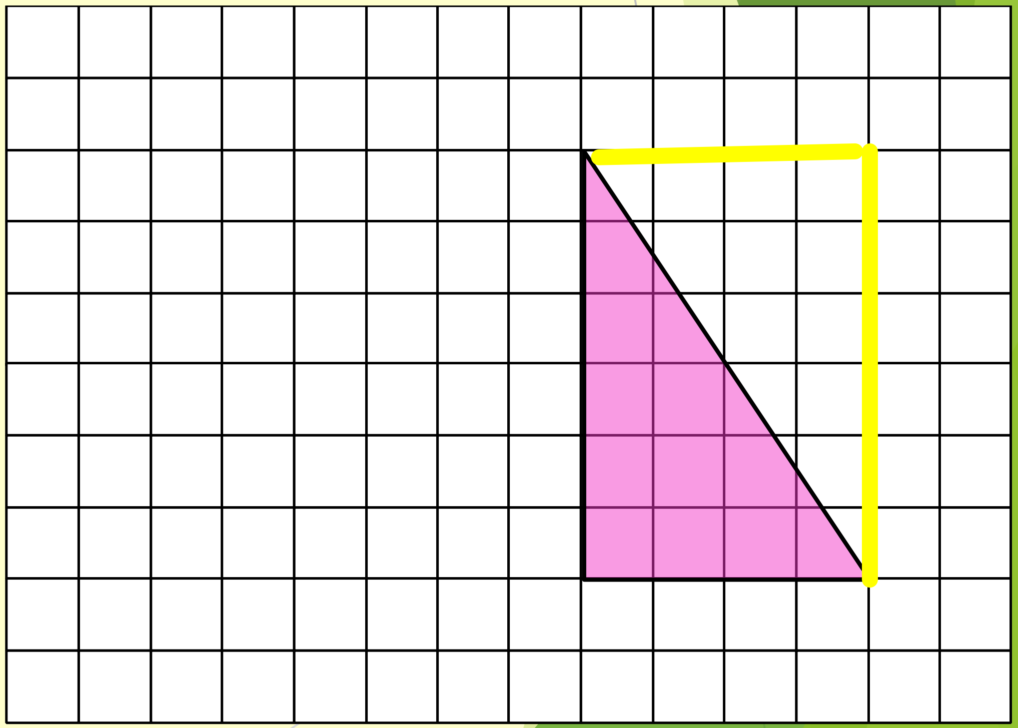


Descriptive Teaching

You can also draw the remaining sides to create the rectangle, before finding the area.

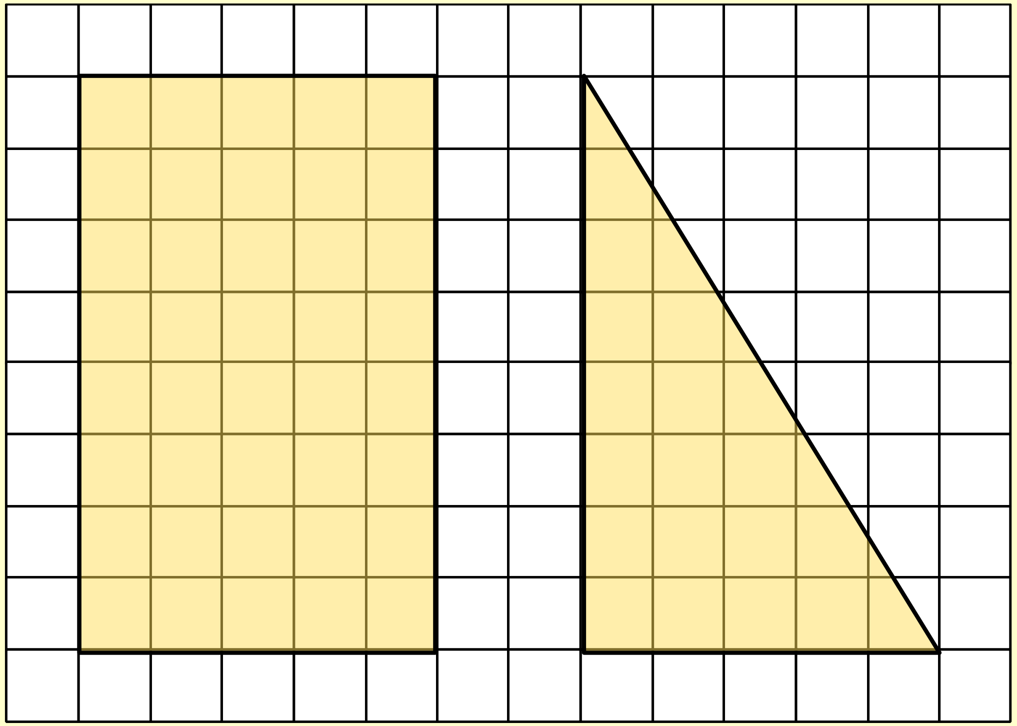
The area of the rectangle is $24cm^2$.

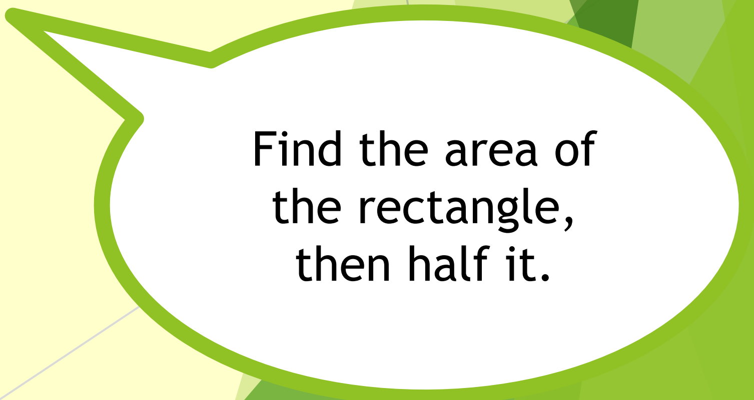
$24cm^2 \div 2 = 12cm^2$.



Descriptive Doing

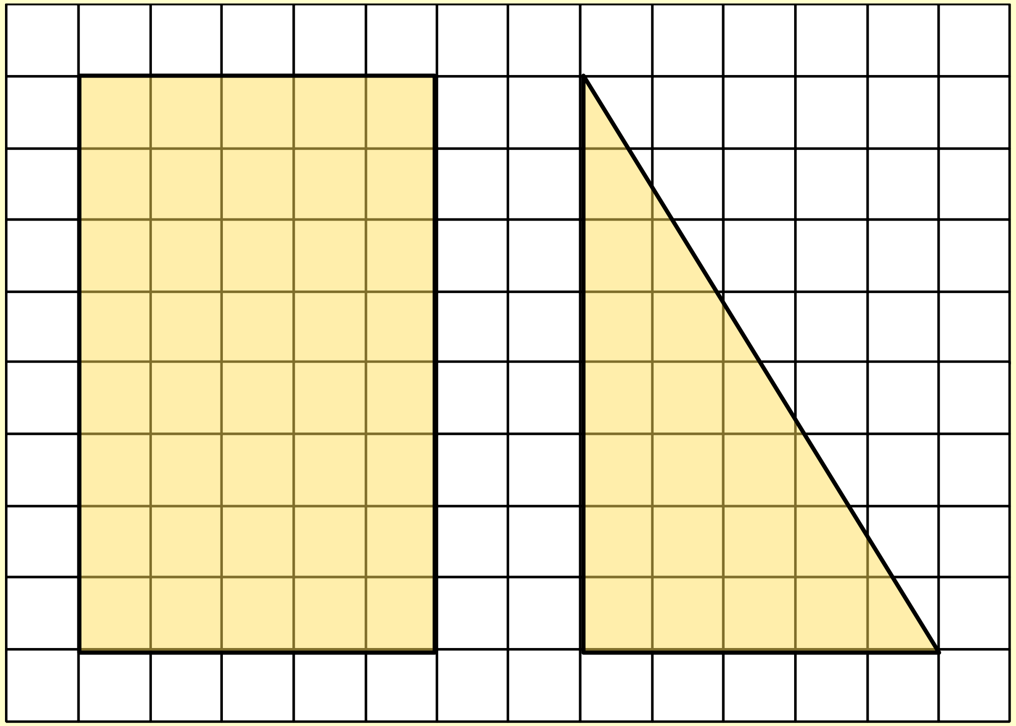
What is the area of the right-angled triangle?





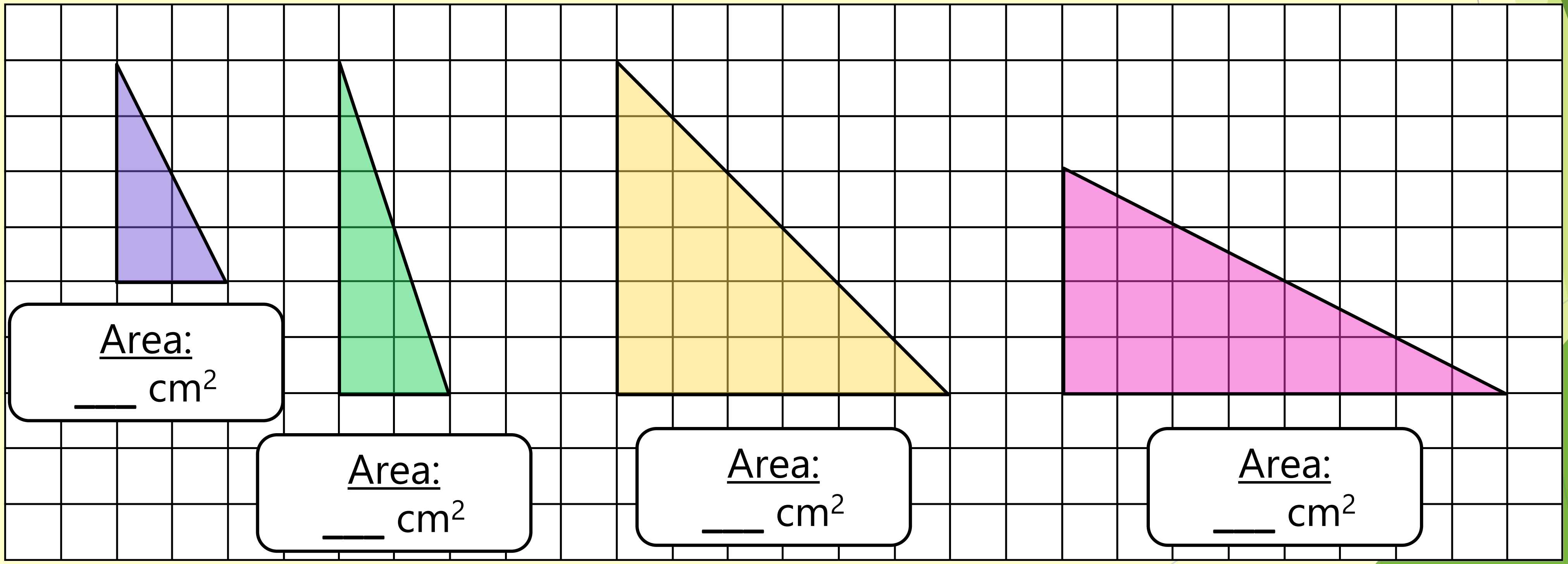
Descriptive Doing - ANSWERS

The area of the rectangle is 40cm^2. The area of the right-angled triangle is 20cm^2.

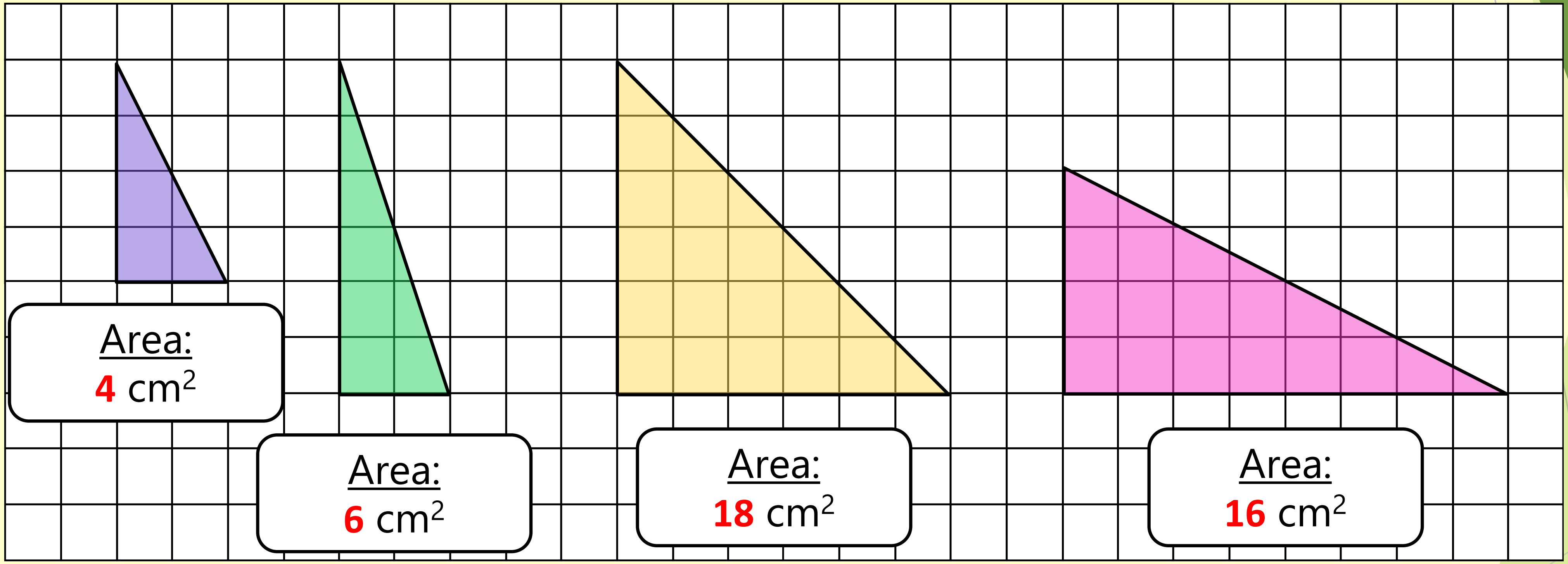


Descriptive Doing

Calculate the areas of the right-angled triangles.



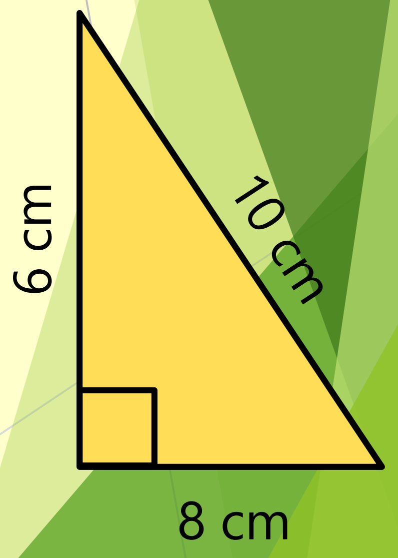
Descriptive Doing - ANSWERS



Reflective Teaching

The formula for finding the area of a triangle is ½ x base x perpendicular height.

e.g. the base of this triangle is 8cm and the perpendicular height is 6cm.



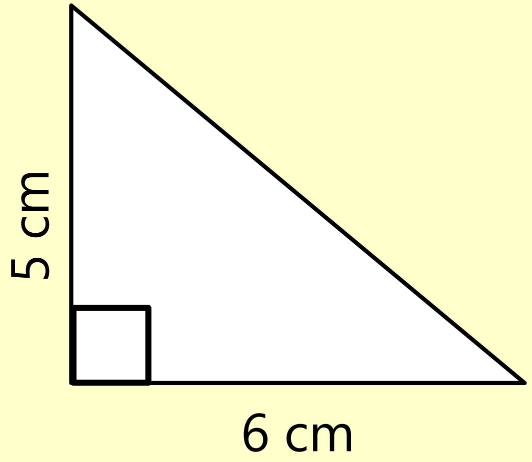
Therefore 8cm x 6cm = 48cm

48cm ÷ 2 = 24cm².

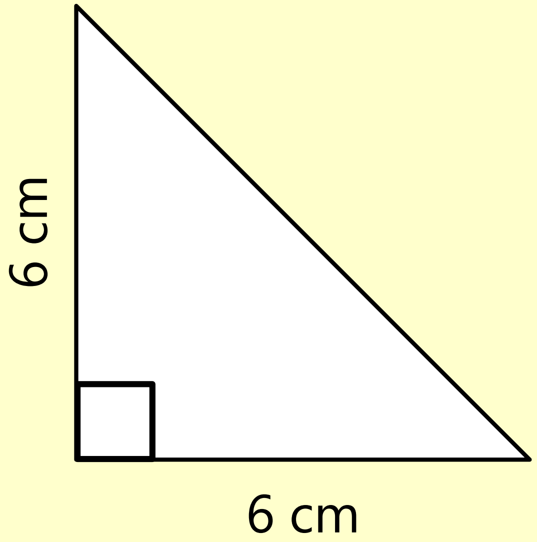
Reflective Doing

Calculate the areas of the right-angled triangles using the formula:

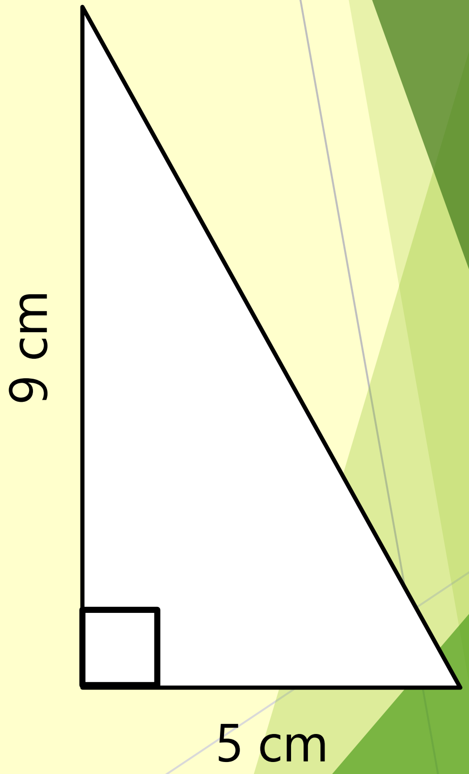
½ x base x perpendicular height.



Area:
___ cm^2

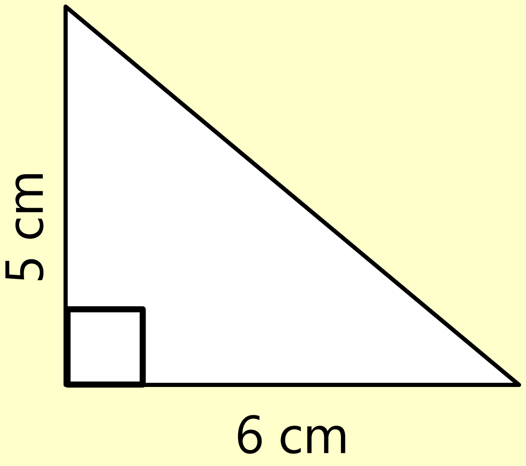


Area:
___ cm^2

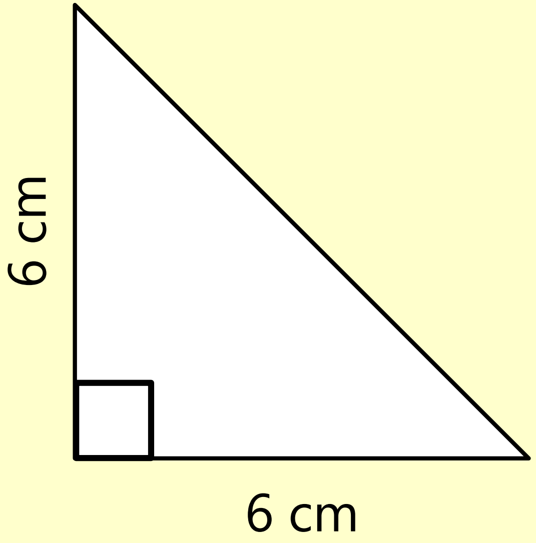


Area:
___ cm^2

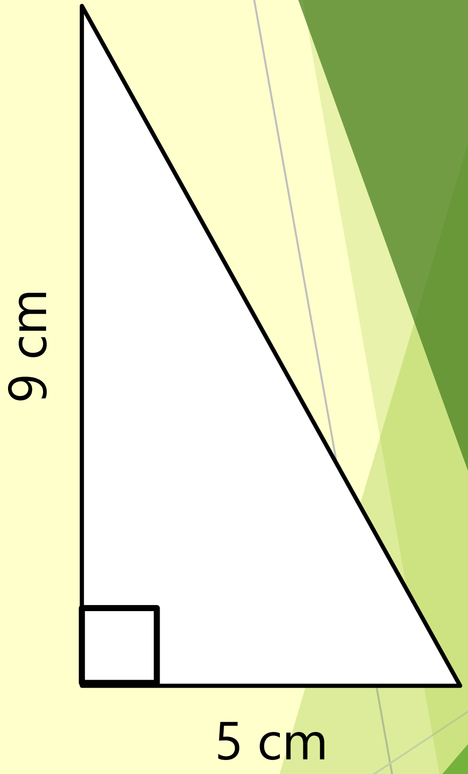
Reflective Doing - ANSWERS



Area:
15 cm^2



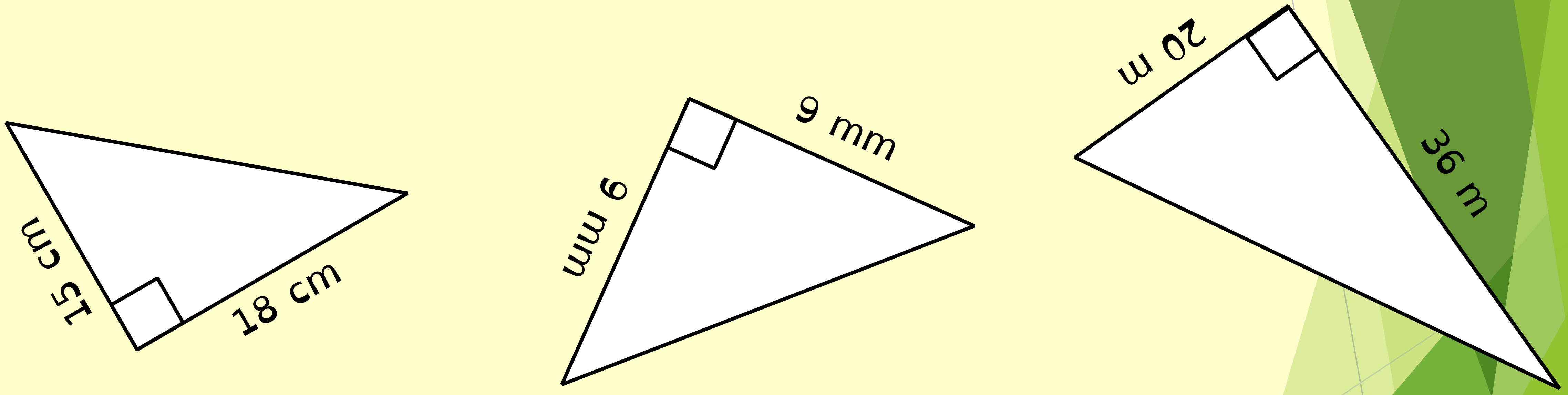
Area:
18 cm^2



Area:
22.5 cm^2

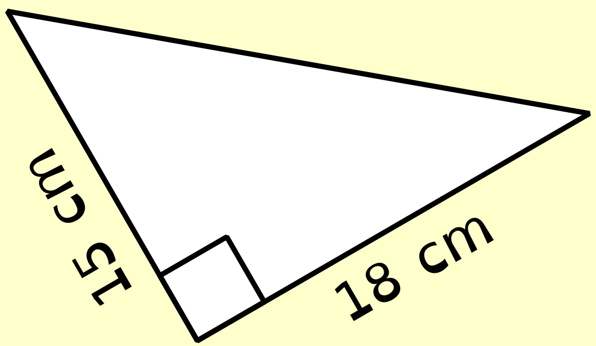
Reflective Doing

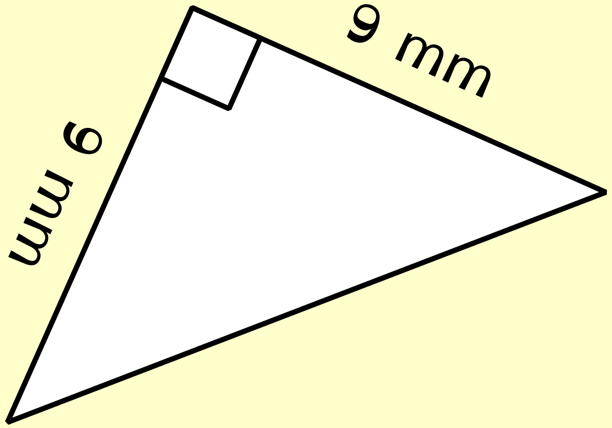
Calculate the areas of the right-angled triangles.

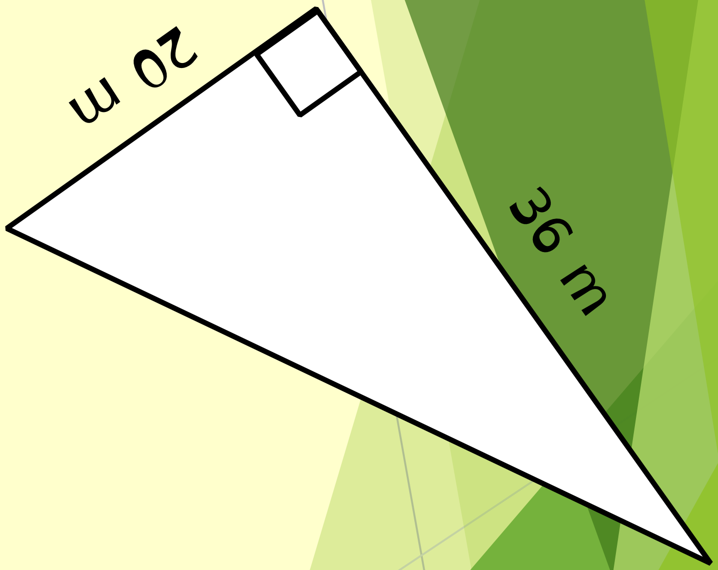


Area: ___ cm^2	Area: ___ mm^2	Area: ___ m^2

Reflective Doing - ANSWERS







Area:
135 cm^2

Area:
40.5 mm^2

Area:
360 m^2

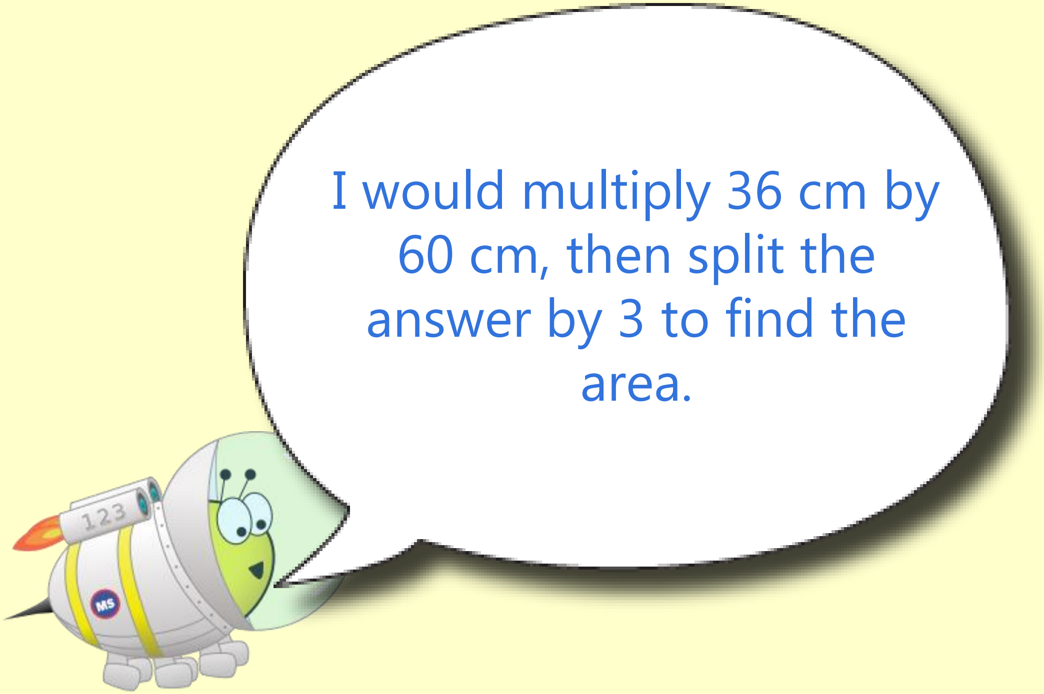
Choose your challenge

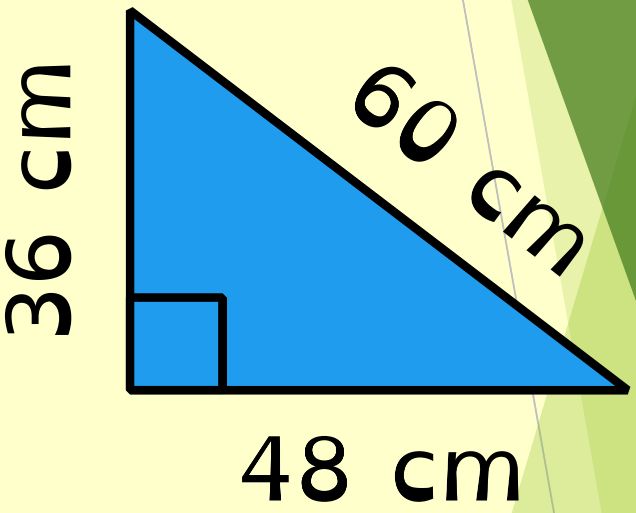
Challenges can be found on the document named 'Maths Challenges Day 4'.

Choose an appropriate challenge OR work through green, orange and red.

Answers can be found at the bottom of the document.

Reflection Time





Astrobee has made two errors in the suggested strategy above.

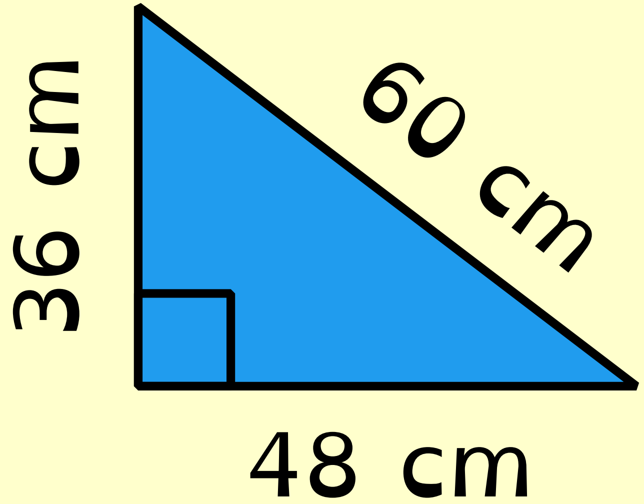
Correct the strategy and find the area of the triangle.

Reflection Time - ANSWERS

The area of the triangle is $864cm^2$.

$48cm \times 36cm = 1728cm^2$.

$1728cm^2 \div 2 = 864cm^2$.

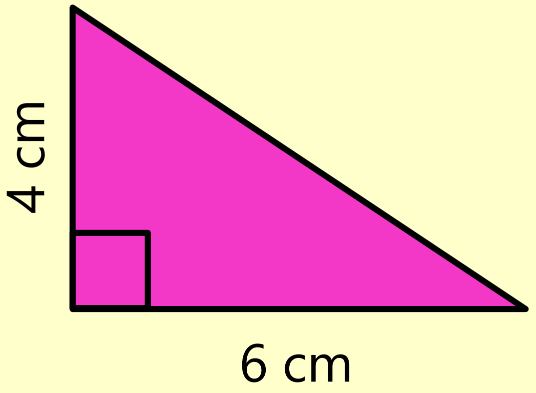


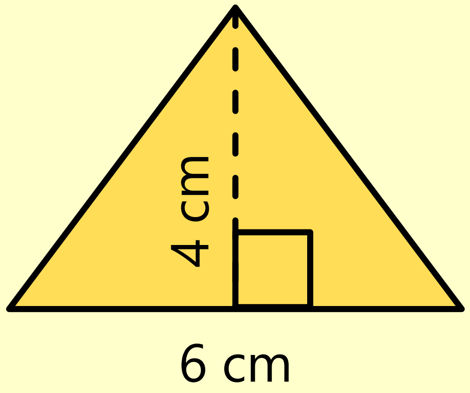
Perimeter, Area and Volume

Day 5

Starter

What's the same? What's different?

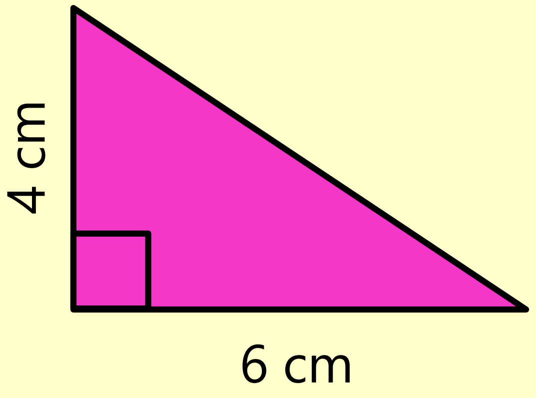


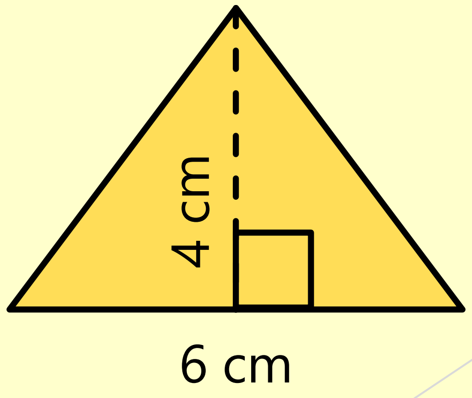


Explain your answer.

Starter - ANSWERS

Both triangles share the same base and perpendicular height, so have the same area as (6cm x 4cm) ÷ 2 = 12cm^2. The pink triangle is right-angled and the yellow is isosceles.





Date: Day 5

LO: To calculate the area of a triangle.

Key Vocabulary

Date: Day 5

LO: To calculate the area of a triangle.

Success Criteria

I can use my knowledge of calculating the area of right-angled triangles to calculate the area of other types of triangles.

I can explain my reasoning.

Descriptive Teaching

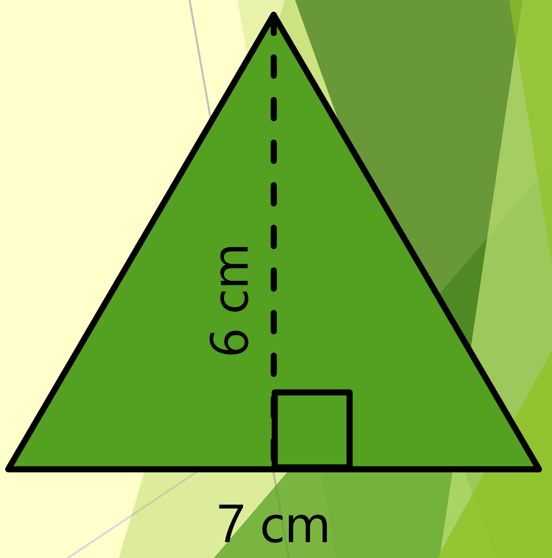
To find the area of any triangle you use the formula:

½ x base x perpendicular height.

E.g. 7cm x 6cm = 42cm

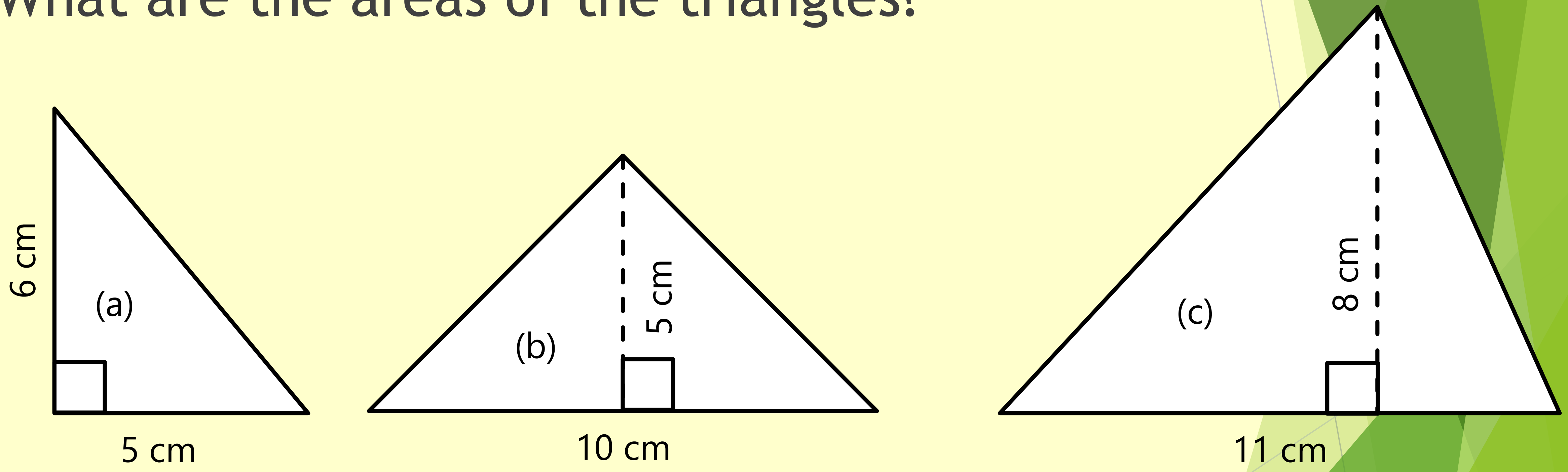
42cm ÷ 2 = 21cm^2

The area of the triangle is 21cm^2.



Descriptive Doing

What are the areas of the triangles?



Area:

___ cm^2

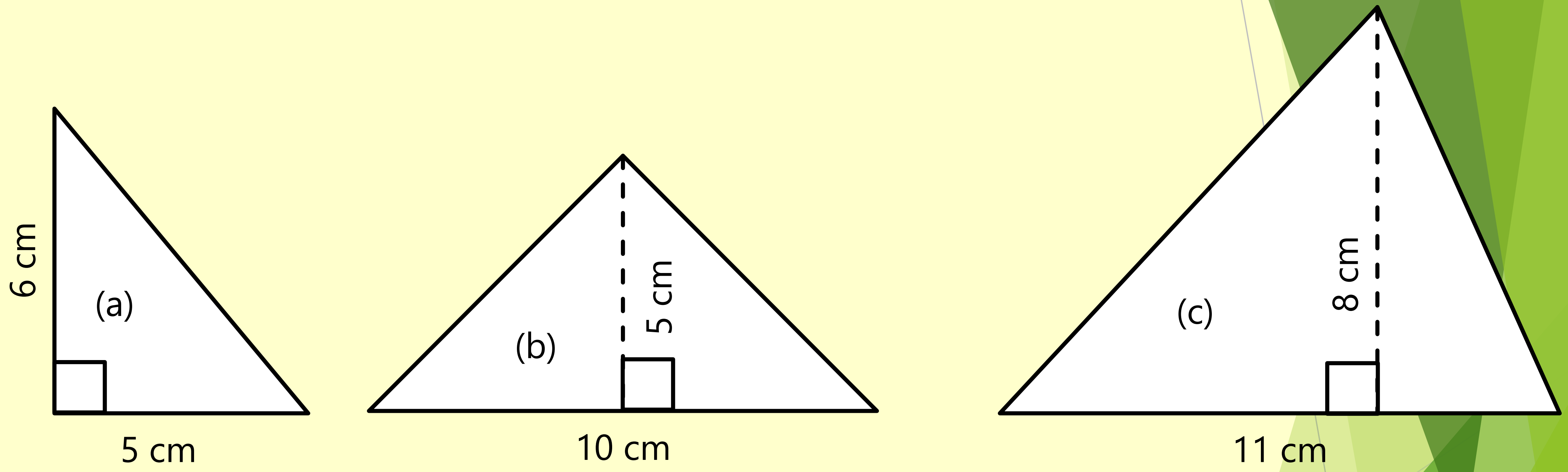
Area:

___ cm^2

Area:

___ cm^2

Descriptive Doing - ANSWERS



<u>Area</u>:

15 cm^2

<u>Area</u>:

25 cm^2

<u>Area</u>:

44 cm^2

Descriptive Doing

___ is correct because…

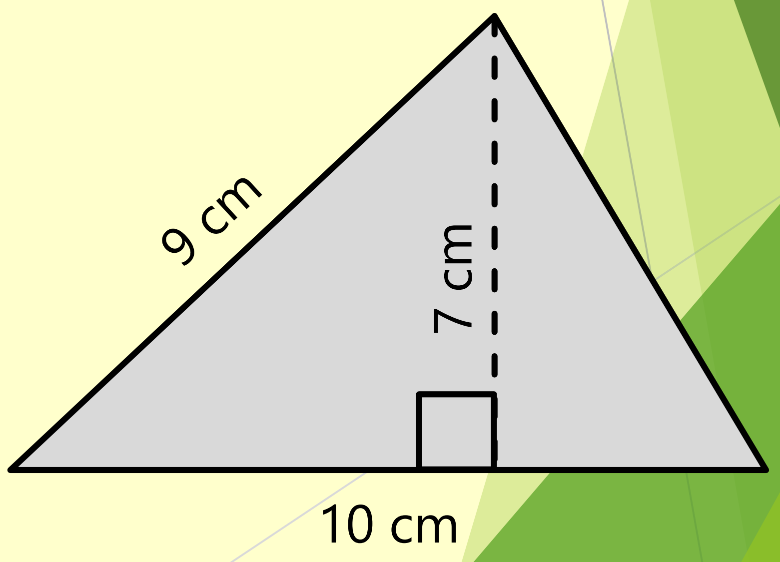
Yasmin says, "The area of the triangle is 70 cm^2."

Ahmed says, "The area of the triangle is 35 cm^2."

Jamal says, "The area of the triangle is 45 cm^2."

Only one of them is correct. Who?

Explain your answer.

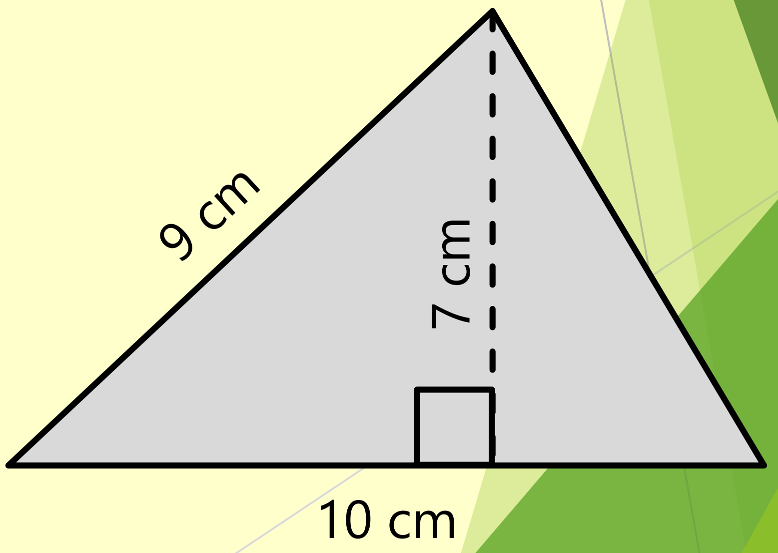


Descriptive Doing - ANSWERS

Ahmed is correct.

He has multiplied the base by the perpendicular height and halved the result:
$(10cm \times 7cm) \div 2 = 35cm^2$.

Yasmin has forgotten to halve the result. Jamal has multiplied the other side length by the base and halved the result, so his answer of $45cm^2$ is incorrect.



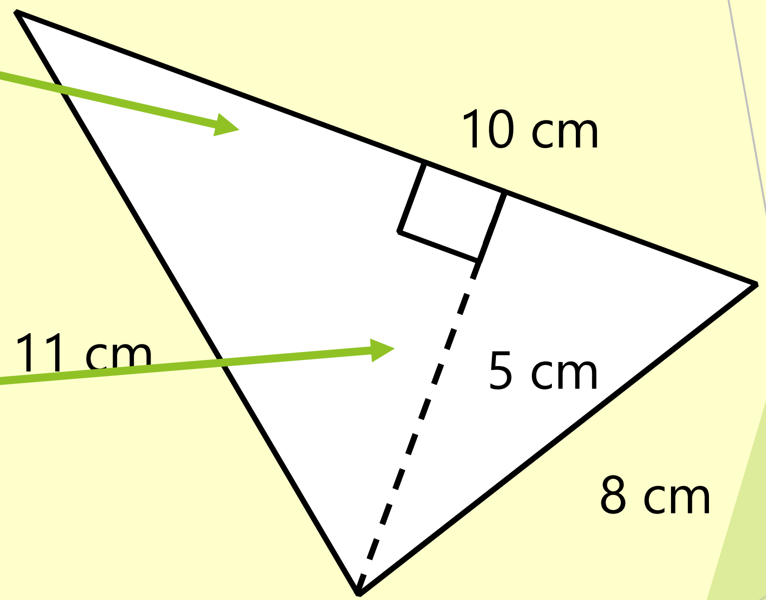
Reflective Teaching

The base is

(10cm)

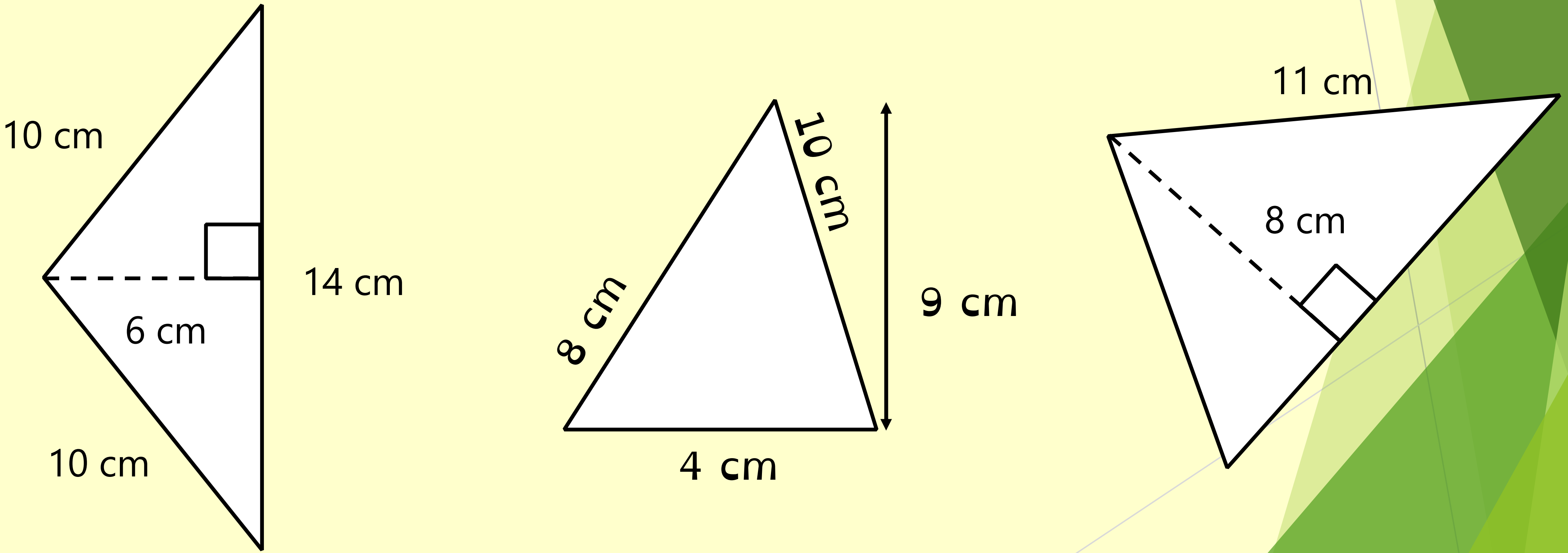
The perpendicular height is

(5cm)

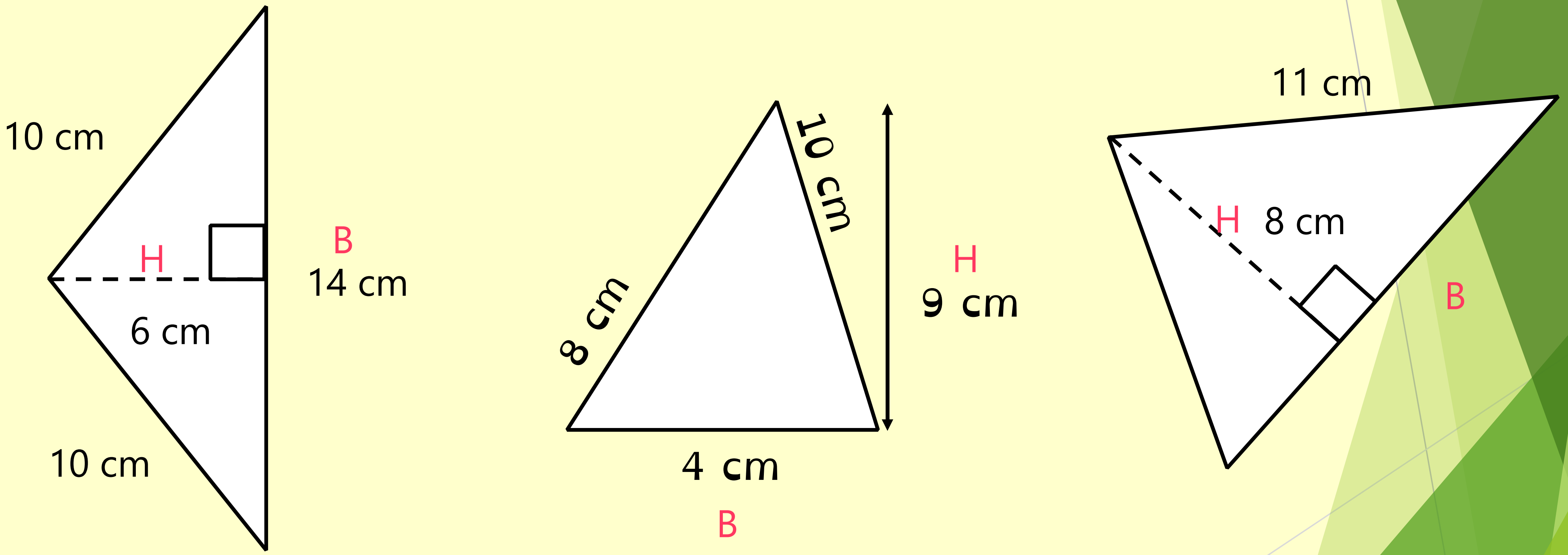


Reflective Doing

Point to the base (B) and the perpendicular height (H) on the triangles.

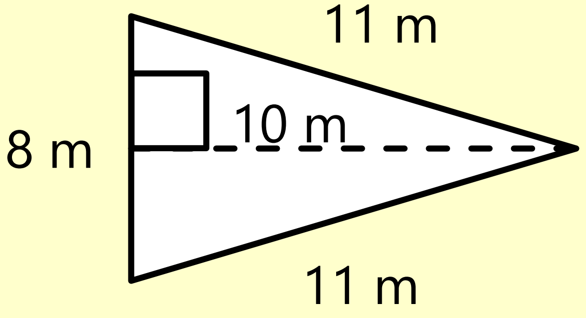


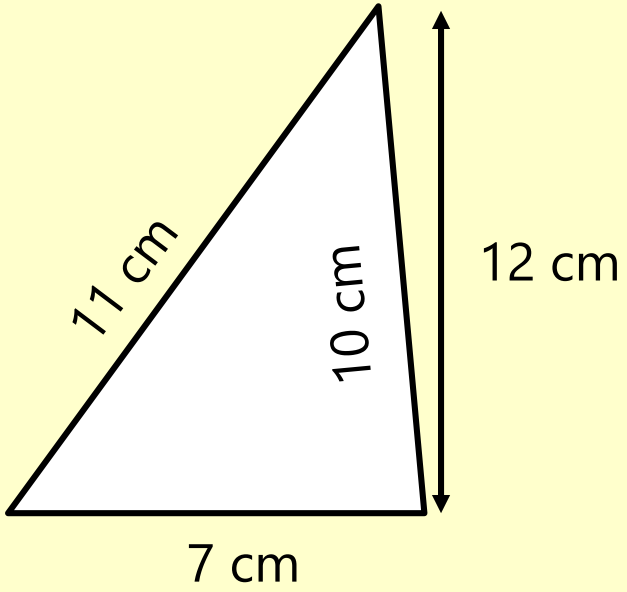
Reflective Doing - ANSWERS

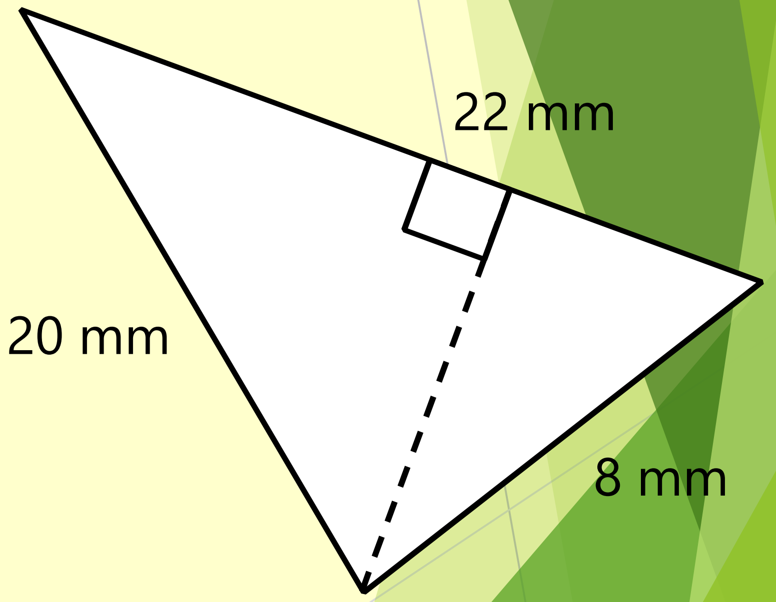


Reflective Doing

Calculate the area of the triangles.







Area:

___ m^2

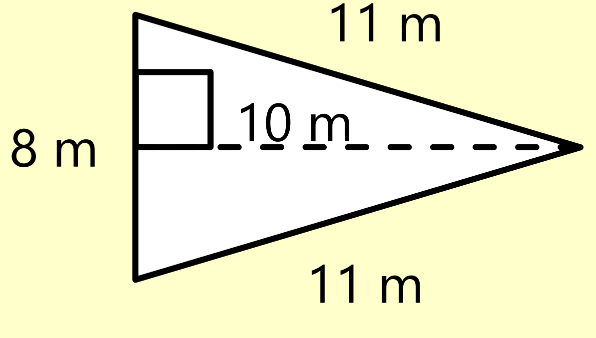
Area:

___ cm^2

Area:

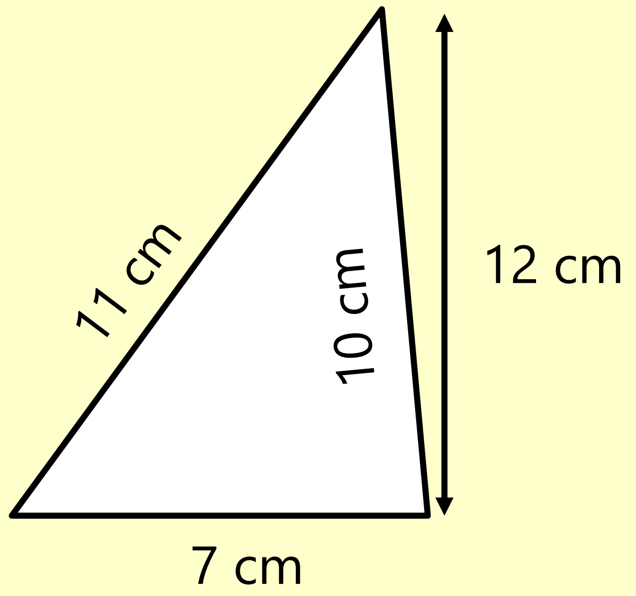
___ mm^2

Reflective Doing - ANSWERS



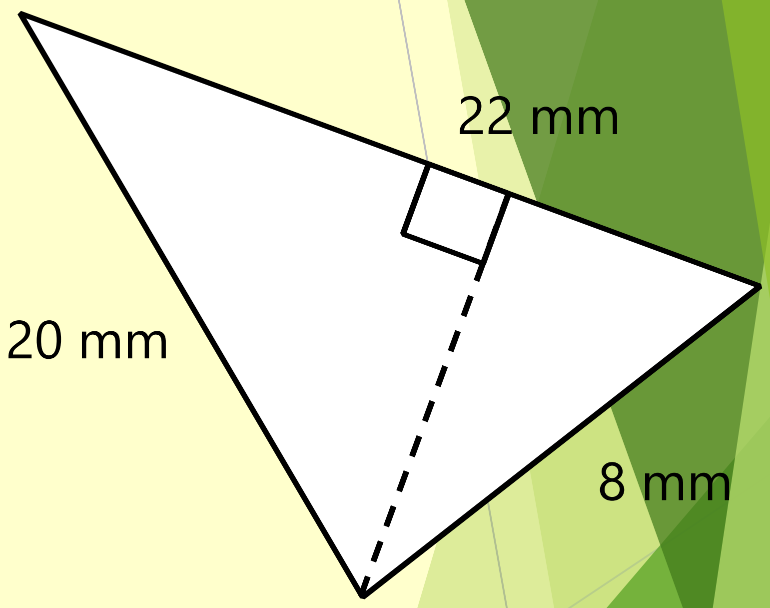
Area:

40 m²



Area:

42 cm²



Area:

99 mm²

Reflective Teaching

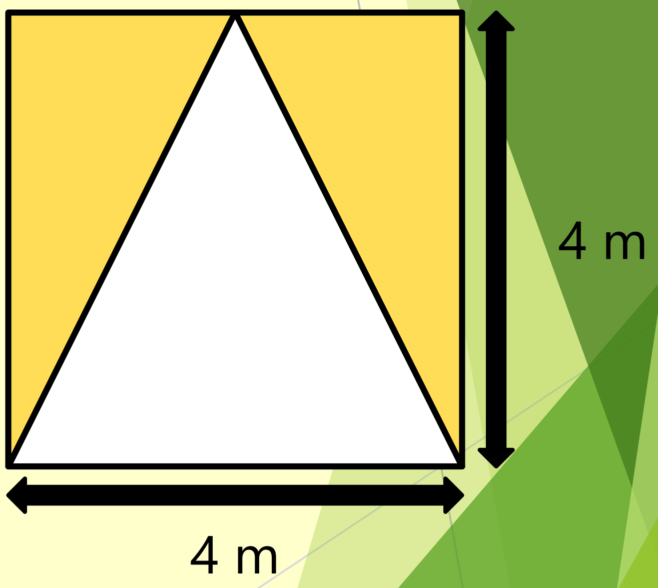
What is the value of the yellow area?

To find the value, you need to find the area of the white triangle first.

4m x 4m = 16m

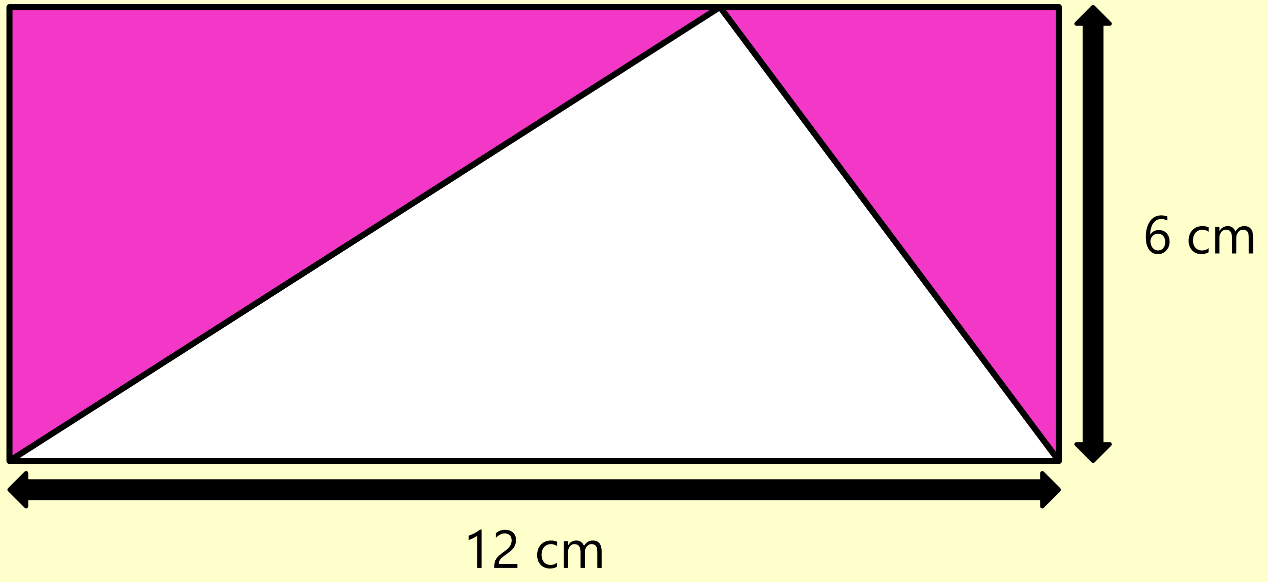
16m ÷ 2 = 8m²

The yellow are is the same size as the white triangle, so the value is 8m².



Reflective Doing

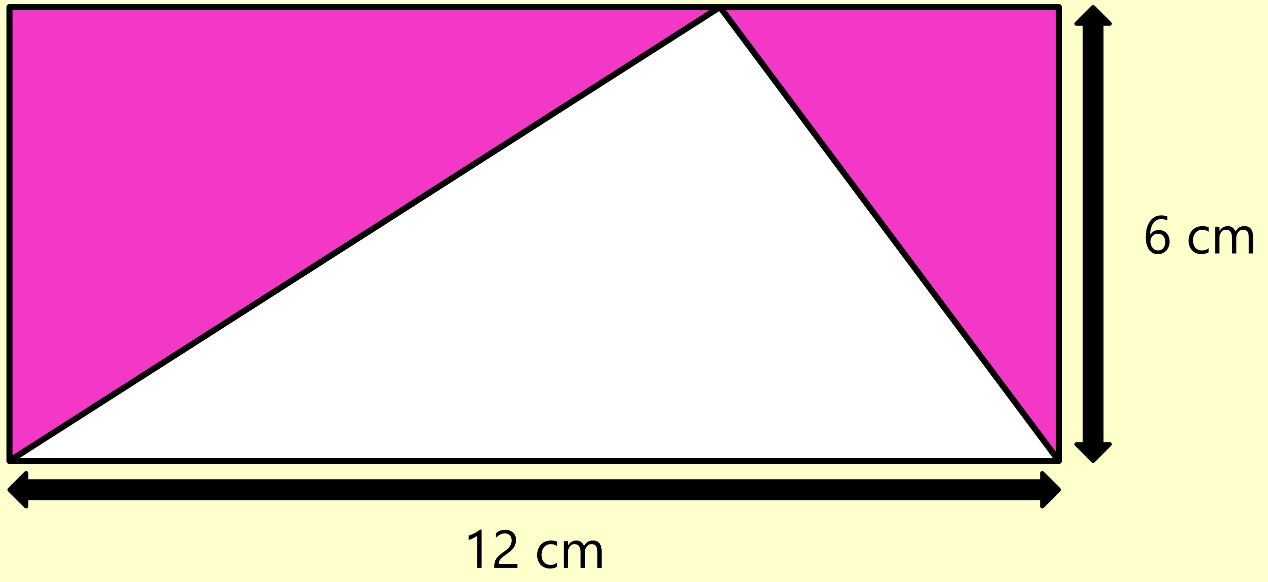
What is the value of the pink area?



Use the method shown on the slide before.

Reflective Doing - ANSWERS

The value of the pink area is $36cm^2$.



Reflective Teaching

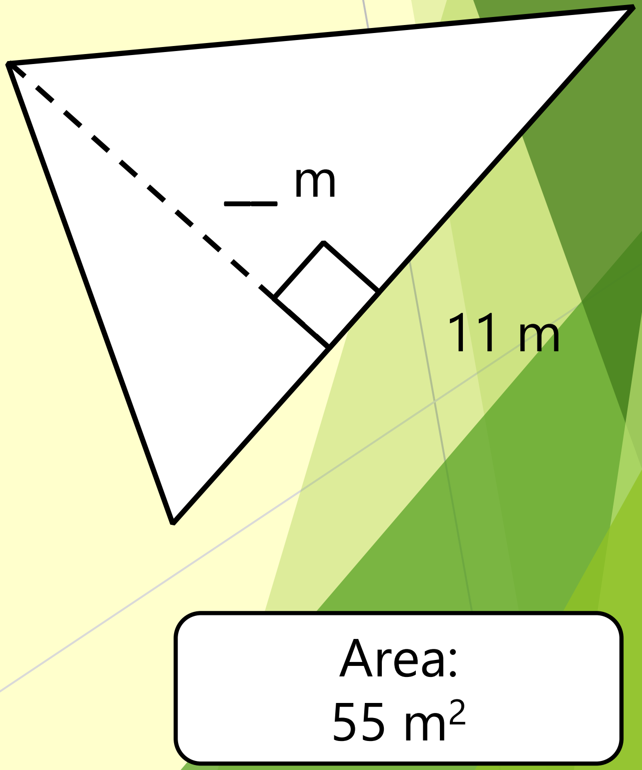
To find the missing value on a triangle, you will need to use inverse operations.

For example, the area is $55m^2$.

$55m^2 \times 2 = 110^2$

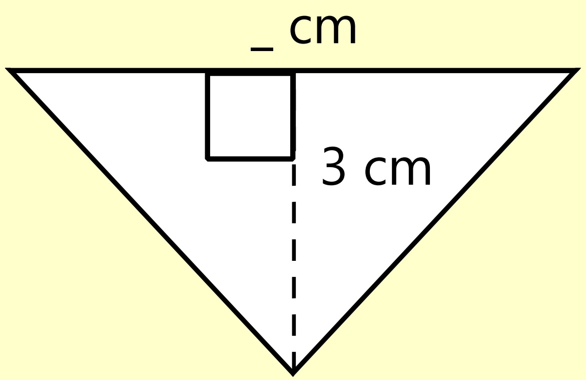
$110^2 \div 11m = 10m$

(Multiply the area by 2, then divide by the given side).

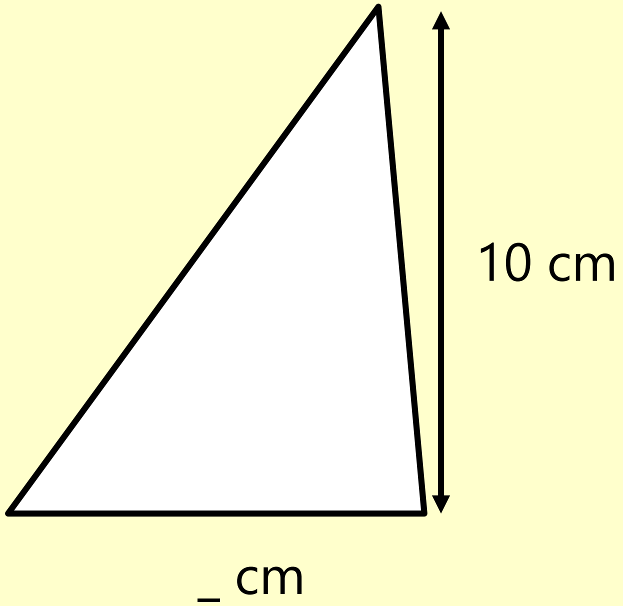


Reflective Doing

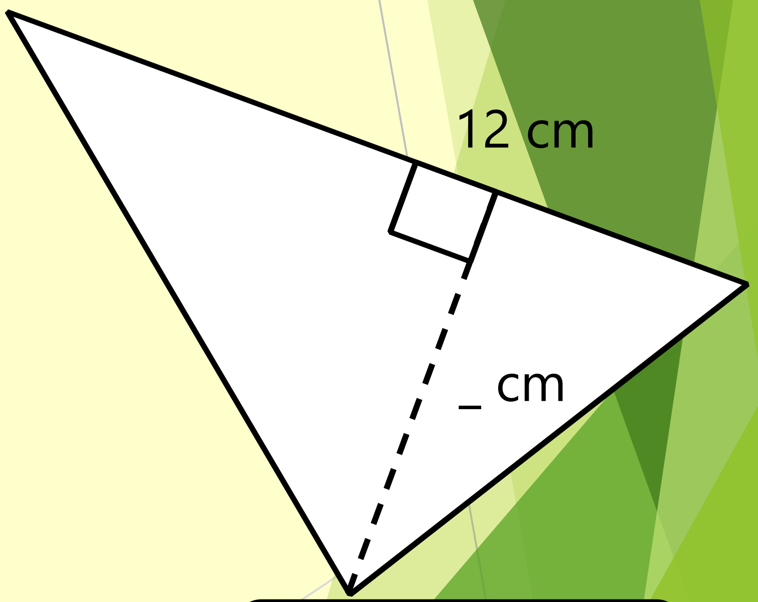
What is the missing value for each of the triangle’s?



Area:
3 cm^2

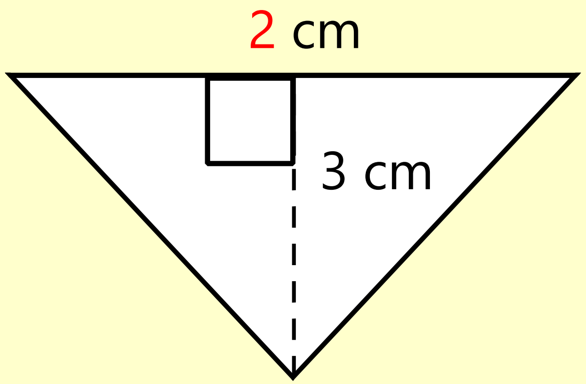


Area:
30 cm^2

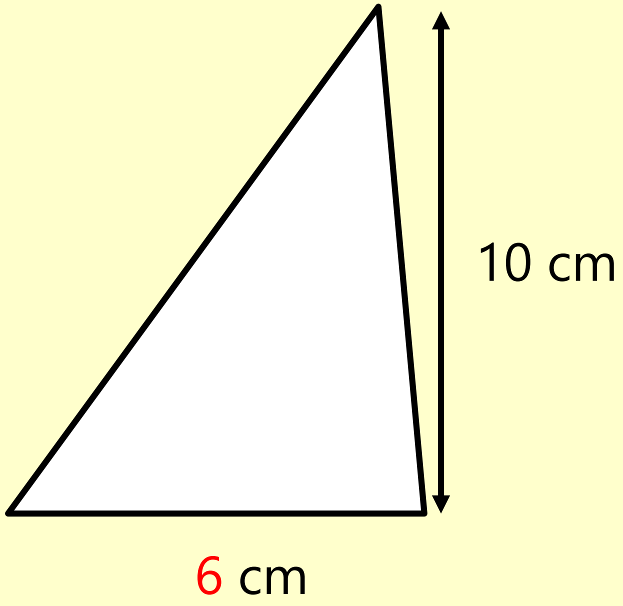


Area:
24 cm^2

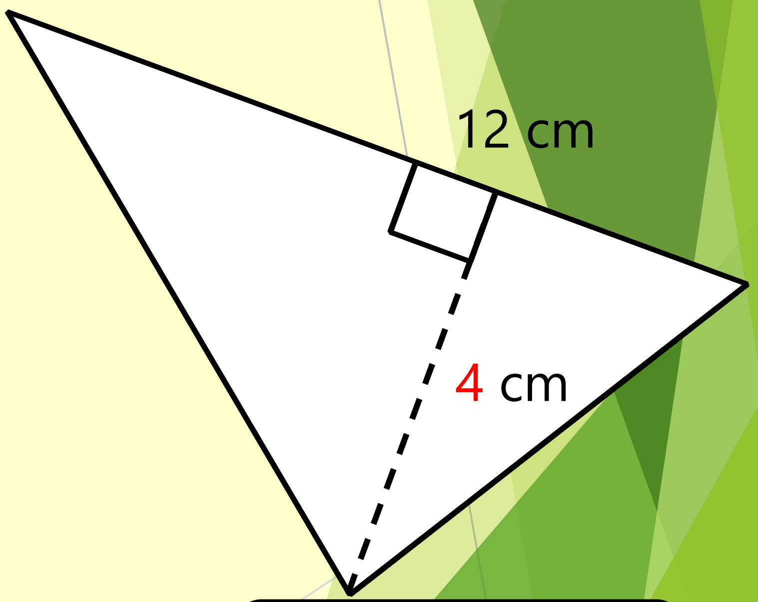
Reflective Doing - ANSWERS



Area:
$3\ cm^2$



Area:
$30\ cm^2$



Area:
$24\ cm^2$

Choose your challenge

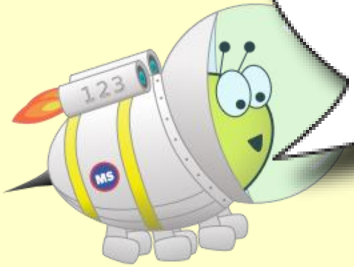
Challenges can be found on the document named ‘Maths Challenges Day 5’.

Choose an appropriate challenge OR work through green, orange and red.

Answers can be found at the bottom of the document.

Reflection Time

If a triangle's base is odd and its perpendicular height is even, its area will be an odd amount.



The statement is ___ true because...

Is Astrobee's statement sometimes, always or never true?

Provide examples to explain your answer.

Reflection Time - ANSWERS

Astrobee's statement is sometimes true. For example, if a triangle has a base of 4cm and a height of 3cm, it will have an even area of $6cm^2$. However, if it has a base of 6cm and a height of 7cm, it will have an odd area of $21cm^2$.