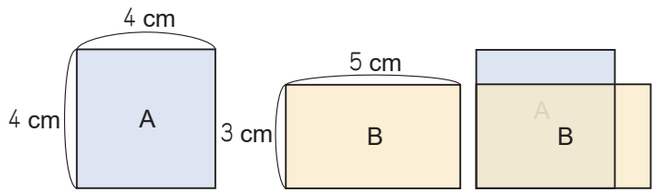
9 - 1 Area
How to Express an Amount of Space

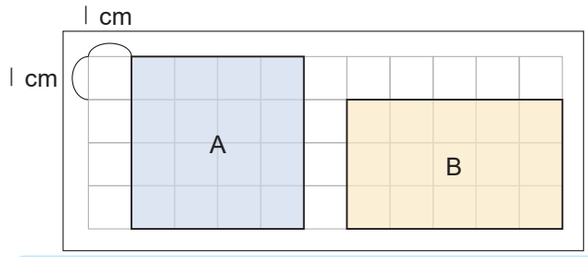
Instruction Which one is bigger?



Square A looks bigger, but the sum of the lengths of all sides is the same.
Square A: $4 \times 4 = 16$ cm
Rectangle B: $(5 + 3) \times 2 = 16$ cm

How about laying graph paper with 1 cm square sides underneath and counting the number of squares?

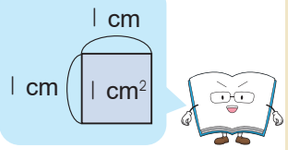
Example Compare the size of Square A and Rectangle B by counting the number of squares.



Square A has 16 squares.

Rectangle B has 15 squares.

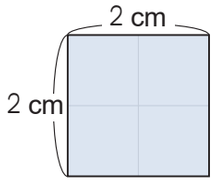
- The size of a figure is called its "**area**".
- The area of a square with 1 cm side is 1 **square centimeter**, and it is written as 1 **cm²**.
- "Square centimeter" is a unit of area.

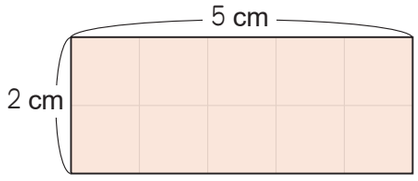


Square A has an area of 16 cm² and Rectangle B has an area of 15 cm².
Thus, the extent of [Square A] is larger than [Rectangle B]

Find the area of the rectangle and the square below.

1. How many 1 cm squares are there?
2. How much cm² is it?





[ ] 1 cm square sides.

[ ] cm².

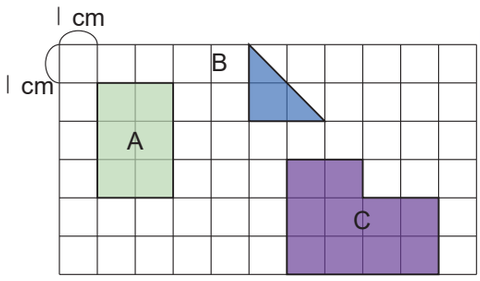
[ ] 1cm squares.

[ ] cm²

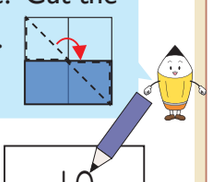
9 - 2 Area

Area of Rectangles and Squares

Example 1 Find the area of each figure below in cm^2.

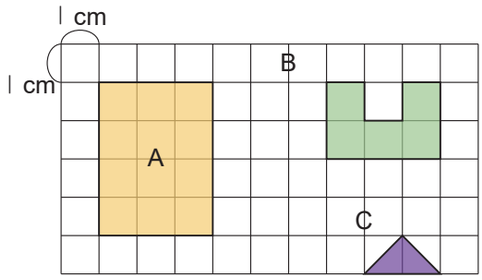


You can make figure B into a rectangle. Cut the upper part of the triangle and move it.



A 6 cm^2 B 2 cm^2 C 10

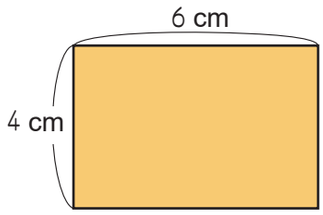
1 Find the area of each figure below in cm^2.

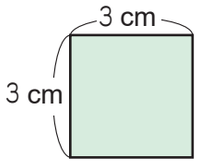


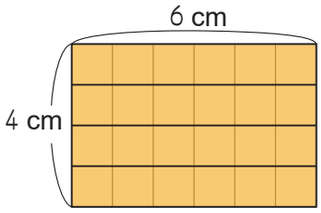
Do we have to count one by one every time?

A B C

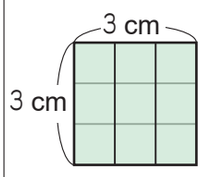
Instruction How to find the area of quadrilaterals.







Number of squares of 1 cm^2 (length)		Number of squares of 1 cm^2 (Width)		Total number of squares of 1 cm^2
6	×	4	=	24
Length (cm)		Width (cm)		Area (cm^2)



Number of squares of 1 cm^2 (side)		Number of squares of 1 cm^2 (side)		Total number of squares of 1 cm^2
3	×	3	=	9
Side (cm)		Side (cm)		Area (cm^2)

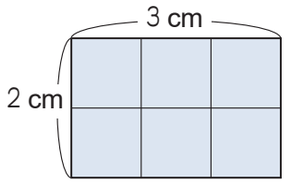
The number of 1 cm^2 squares along the horizontal and the vertical sides are the same as the lengths of those sides.

(Area of Rectangle) = (Length) × (Width)
= (Width) × (Length)

(Area of Square) = (Length of Side) × (Length of Side)

In a square, the lengths of the horizontal and vertical sides are the same in a square.

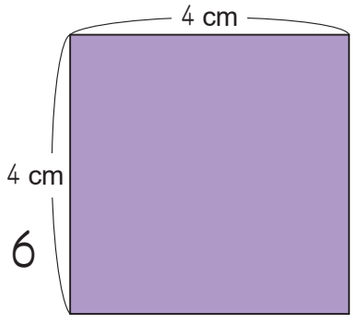
Example 2 Find the area of the following figures.



Math sentence

$3 \times 2 = 6$

Answer 6 cm^2



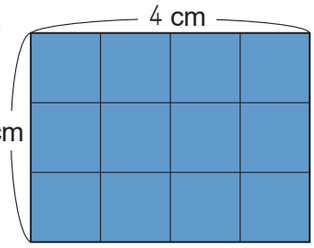
Math sentence

$4 \times 4 = 16$

Answer 16 cm^2

2 Find the area of the following figures.

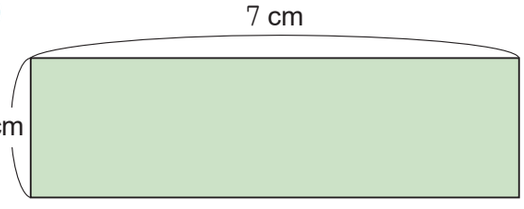
1



Math sentence

Answer _____

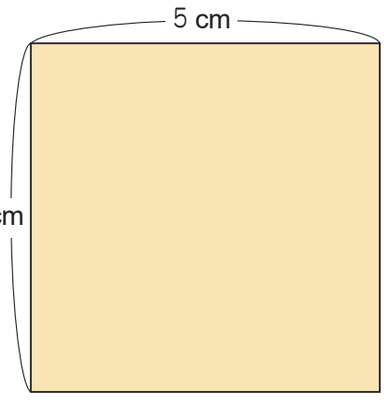
2



Math sentence

Answer _____

3



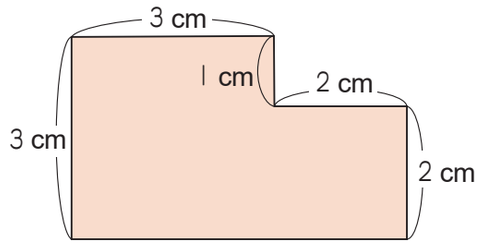
Math sentence

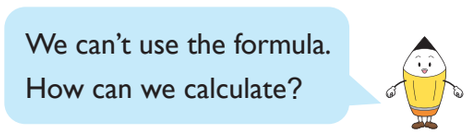
Answer _____

9 – 3 Area

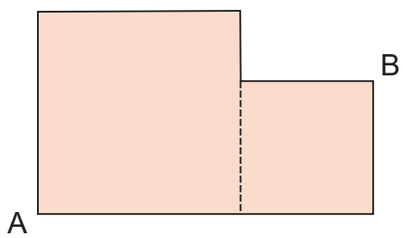
Area of Various Figures

Example Find the coloured area of the following figures.

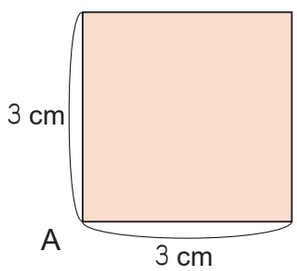




1. The area of the given figure is obtained by separating them into two squares.

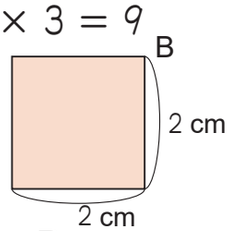


2. Calculate the area separately.



Square A

$3 \times 3 = 9$



Square B

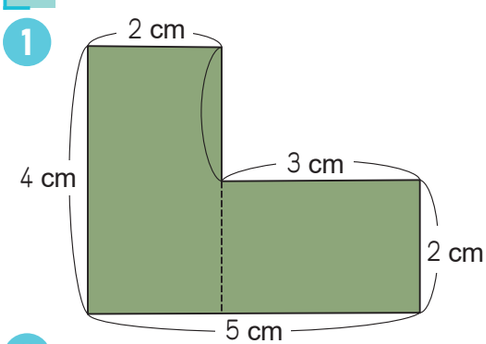
$2 \times 2 = 4$

3. Add the two areas.

$9 + 4 = 15$ $15\ cm^2$

1 Find the coloured area of the following figures.

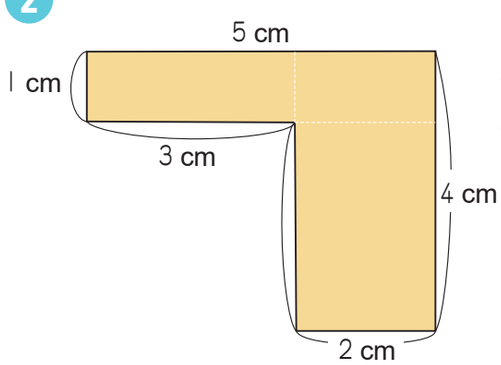
1



Math sentence

Answer _____

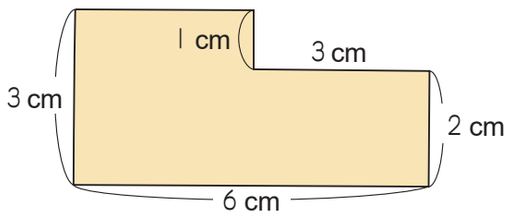
2

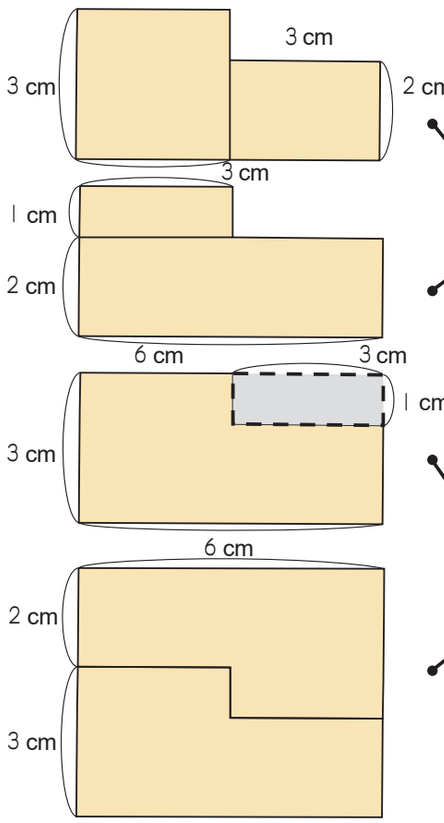


Math sentence

Answer _____

Example 2 Find the area of the following figures. Match the math sentence and figures.





$(3 \times 1) + (6 \times 2) = 15$

$15\ cm^2$

$(3 \times 3) + (3 \times 2) = 15$

$15\ cm^2$

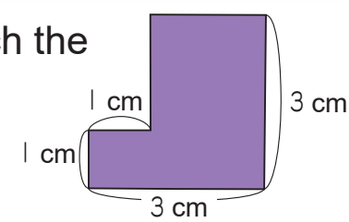
$(6 \times 5) \div 2 = 15$

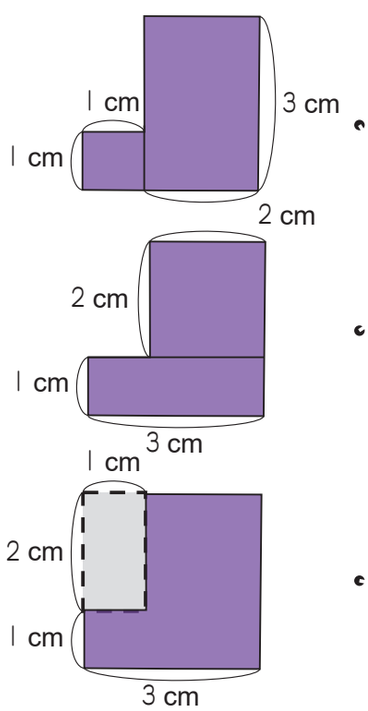
$15\ cm^2$

$(6 \times 3) - (3 \times 1) = 15$

$15\ cm^2$

2 Find the area of the following figures. Match the math sentence and figures.





$(3 \times 1) + (2 \times 2) = 7$

$7\ cm^2$

$(1 \times 1) + (3 \times 2) = 7$

$7\ cm^2$

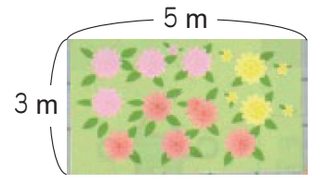
$(3 \times 3) - (2 \times 1) = 7$

$7\ cm^2$

9 - 4 Area

Large Areas (m^2 and km^2)

Example 1 Find the area of the following flowerbed.

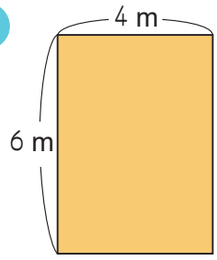


- The area of a square with 1 m sides is **one square metre**. It is written as 1 **m^2**.
- To express the area of a large space like a classroom, you can use square metres.

Math sentence $5 \times 3 = 15$ Answer 15 m^2

1 Find the area of the following figures.

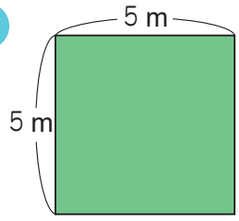
1



Math sentence

Answer _____

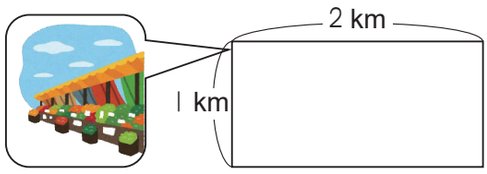
2



Math sentence

Answer _____

Example 2 Find the area of a local market. It has 1 km and 2 km long side.

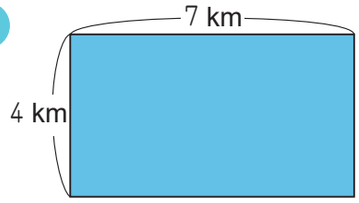


- The area of a square with 1 km sides is **one square kilometer**. It is written as 1 **km^2**.
- To express the area of a large space like islands and countries you can use square kilometres.

Math sentence $2 \times 1 = 2$ Answer 2 km^2

2 Find the area of the following figures.

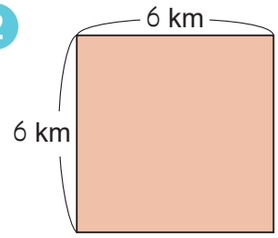
1



Math sentence

Answer _____

2



Math sentence

Answer _____

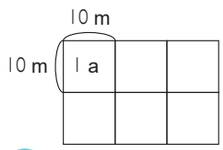
Other units of area are as follows:

- The area of a square with 10 m sides is called **one are**. It is written as 1 **a**.
  10 m × 10 m = 100 m^2 = 1 a
- The area of a square with 100 m sides is **one hectare**, and it is written as 1 **ha**.
  100 m × 100 m = 10000 m^2 = 1 ha

9 - 5 Area
Relation between Units of Areas

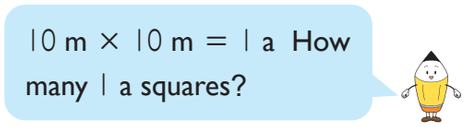
Example 1 Find the following areas with specified unit in ( ).

1 A rectangle with 30 m length and 20 m width (a)



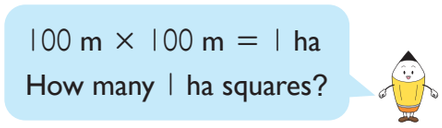
Math sentence $3 \times 2 = 6$

Answer 6 a



2 A square with 200 m sides (ha)

Math sentence $2 \times 2 = 4$ Answer 4 ha



1 Find the area of the following figures with specified unit in ( ).

1 A rectangle with 80 m length and 30 m width (a)

Math sentence

Answer _____

2 A square with 300 km sides (ha)

Math sentence

Answer _____

Example 2 Fill in the blank with numbers to see the relation between the length of a side and the area of a square.

	10 times	10 times	
Length of a side	1 cm	10 cm	1 m (100 cm)
Area	1 cm^2	100 cm^2	10000 cm^2
	100 times	100 times	

2 Fill in the blank with numbers to see the relation between the length of a side and the area of a square.

	☐ times	☐ times	
Length of a side	10 m	100 m	1 km (1000 m)
Area	(m^2)	(m^2)	(m^2)
	☐ times	☐ times	

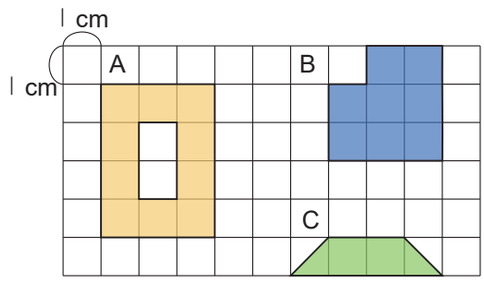
9 - 6 Area

Review

1 Fill in each of the ☐ with a unit of area or a word.

1. Area of a rectangle = length × ☐
2. Area of a square = ☐ × ☐
3. The area of a square with 1 cm sides is 1 ☐
4. The area of a square with 1 m sides is 1 ☐
5. The area of a square with 1 km sides is 1 ☐

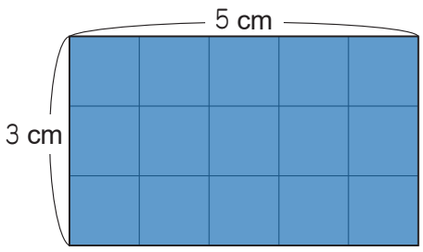
2 Find the area of each coloured figure below in cm^2.



A ☐ B ☐ C ☐

3 Find the area of the following figures.

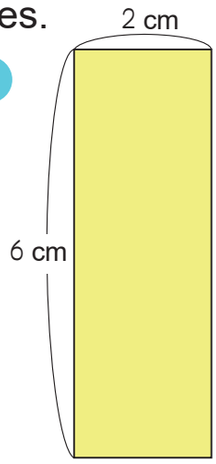
1



Math sentence

Answer _____

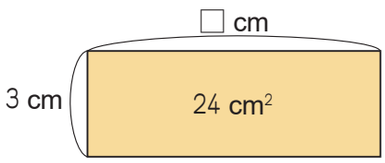
2



Math sentence

Answer _____

4 I want to make a rectangle with an area of 24 cm^2 and a width of 3 cm. How many cm should the length be?

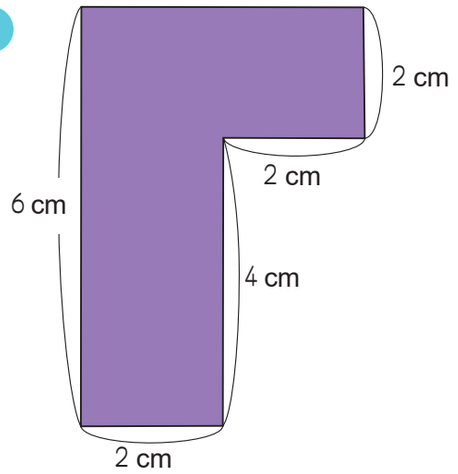


Math sentence

Answer _____

5 Find the coloured area of the following figures.

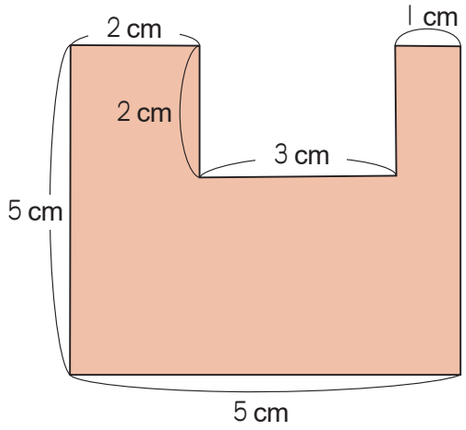
1



Math sentence

Answer _____

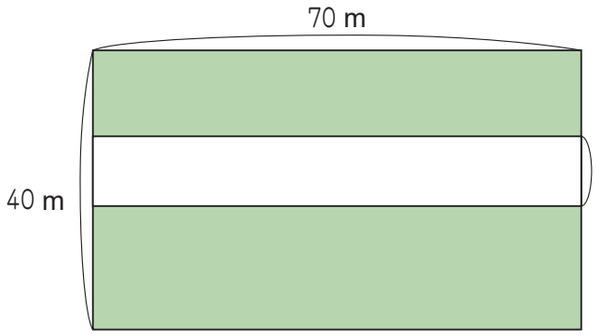
2

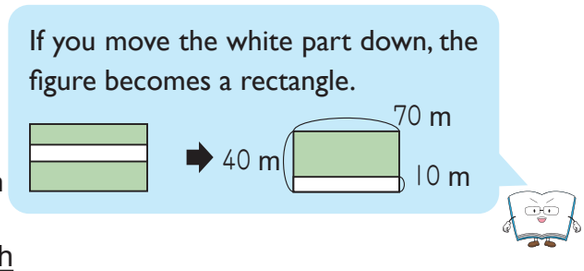


Math sentence

Answer _____

6 In the following rectangular field, the width of the path is 10 m. How many a is the area of the field?



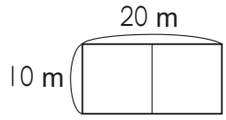


Math sentence

Answer _____

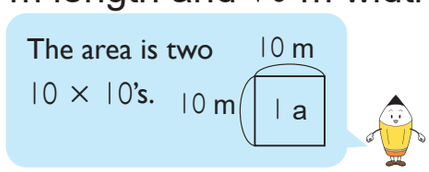
7 Find the area of the following figures with specified unit in ( ).

1 A rectangle with 20 m length and 10 m width (a)



Math sentence

Answer _____



2 A rectangle with east-west 2000 m and north-south 4 km (km^2)

Math sentence

Answer _____