

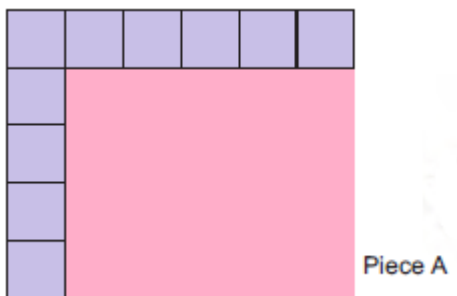
Chapter 11: Areas and Its Boundary

NCERT · Class 5 · Maths

Questions

Question 1

Suggest some ways to find out whose piece is bigger. Discuss.



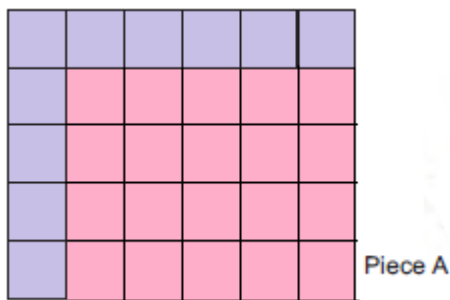
Solution

The length of piece A is 6 cm.

So 6 squares of side 1 cm can be arranged along its length.

The width of piece A is 5 cm.

So 5 squares can be arranged along its width.



Altogether 30 squares can be arranged on it.

So, the area of piece A = $6 \text{ cm} \times 5 \text{ cm} = 30 \text{ square cm}$

Question 2

Altogether how many squares can be arranged on it? _____

Solution

30

Question 3

So the area of piece A = _____ square cm

So the area of piece A = 30 square cm

4. In the same way find the area of piece B.

Solution

Now, the area of piece B = $11 \text{ cm} \times 3 \text{ cm} = 33 \text{ square cm}$

Question 5

Who had the bigger piece? How much bigger?

Solution

So, the area of piece B is bigger than the area of piece A.

Difference in area of piece A and piece B = $33 - 30 = 3 \text{ square cm}$

So, piece B is 3 square cm bigger than piece A.

Cover with stamps:

This stamp has an area of 4 square cm. Guess how many such stamps will cover this big rectangle.



Check your guess:

a) Measure the yellow rectangle. It is _____ cm long.

14cm

b) How many stamps can be placed along its length? _____

7 stamps

c) How wide is the rectangle? _____ cm

8cm

d) How many stamps can be placed along its width? _____

4 stamps

e) How many stamps are needed to cover the rectangle? _____

28 stamps

f) How close was your earlier guess? Discuss.

It was pretty close.

g) What is the area of the rectangle? _____ Square cm

Area of rectangle = $7 \times 4 = 28$ square cm

h) What is the perimeter of the rectangle? _____ cm

Length of the rectangle = 14 cm

Breadth of the rectangle = 8 cm

A rectangle has 2 lengths and 2 breadths.

So, perimeter of the rectangle = Sum of all its sides = Length of its boundary = $14 \text{ cm} + 8 \text{ cm} + 14 \text{ cm} + 8 \text{ cm} = 44 \text{ cm}$

The perimeter of rectangle is 44 cm.

Practice time:

a) Arbaz plans to tile his kitchen floor with green square tiles. Each side of the tile is 10 cm. His kitchen is 220 cm in length and 180 cm wide. How many tiles will he need?



Given length of kitchen = 220 cm

Width of the kitchen = 180 cm

Each side of tile = 10 cm

Area of floor = length $\times$ width

= $220 \times 180 = 39600$ square cm

Area of a tile = side $\times$ side

= $10 \times 10 = 100$ square cm

Number of tiles = area of floor/ area of a tile

$$= 39600/100$$

$$= 396 \text{ tile.}$$

b) The fencing of a square garden is 20 m in length. How long is one side of the garden?

Given perimeter of garden = 20 m which has to be fenced.

Length of one side = perimeter/4

$$= 20/4$$

$$= 5\text{m.}$$

c) A thin wire 20 centimeters long is formed into a rectangle. If the width of this rectangle is 4 centimeters, what is its length?



Given perimeter of a rectangle = 20 cm

Width of a rectangle = 4 cm

We know that perimeter of rectangle = 2 (length + breadth)

$$20 = 2 \text{ length} + 2 \text{ breadth}$$

$$2 \text{ length} = 20 - 2 \text{ breadth}$$

$$2 \text{ length} = 20 - 2 \times 4$$

$$2 \text{ length} = 20 - 8$$

$$\text{Length} = 12/2$$

$$= 6 \text{ cm}$$

d) A square carrom board has a perimeter of 320 cm. How much is its area?



Given perimeter of carrom board is 320 cm

We know that perimeter of square = $4 \times \text{side}$

Side = perimeter/4

Side = $320/4$

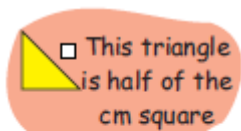
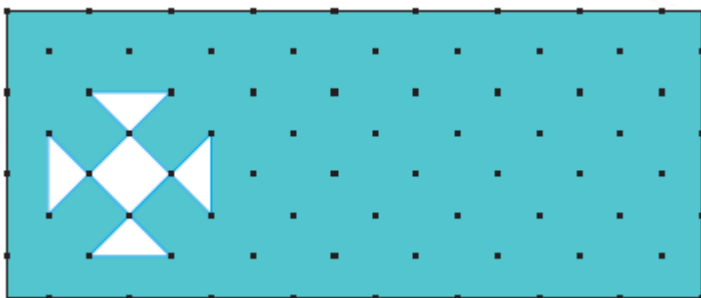
= 80 cm

We know that area of square = side $\times$ side

= 80×80

= 6400 square cm

e) How many tiles like the triangle given here will fit in the white design? Area of design = _____ square cm

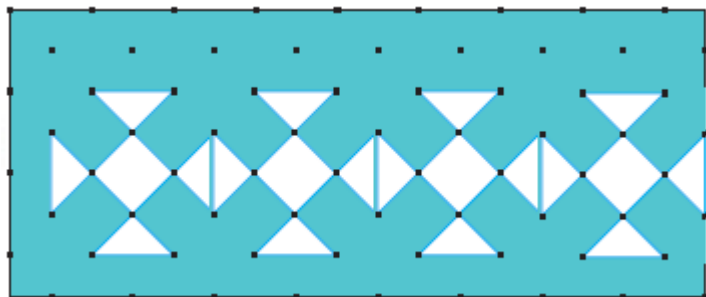


6 triangular tiles will fit in to the given white design.

Now, area of 1 such triangular tile = 12 square cm

Area of 6 triangular tiles that make this design = $6 \times 12 = 3$ square cm

Area of design = 3 square cm



f) Sanya, Aarushi, Manav and Kabir made greeting cards. Complete the table for their cards:

Whose card	Length	Width	Perimeter	Area
Sanya	10 cm	8 cm		
Manav	11 cm		44 cm	
Aarushi		8cm		80 square cm
Kabir			40 cm	100 square cm

Perimeter of Sanya's card = Sum of all its sides = $10 + 8 + 10 + 8 = 36$ cm

Length of Manav's card = 11 cm

Perimeter of his card = 44 cm

We have to find the width of Manav's card.

Perimeter of card = Sum of all its sides = $11 + 11 + \text{sum of 2 other sides} = 22 + \text{sum of 2 other sides}$

Now, sum of two other sides = $44 - 22 = 22$ cm

The two other sides of the greeting cards are width.

So, width of Manav's card = $22 \div 2 = 11$ cm

Width of Aarushi's card = 8 cm

Area of the card = 80 square cm

Now, we have to find length of the card.

Area of card = Length of card $\times$ 8 cm = 80 square cm

So, on dividing the area of card by its width, we can get its length.

Therefore, length of Aarushi's card = $80 \div 8 = 10$ cm

Whose card	Length	Width	Perimeter	Area
Sanya	10 cm	8 cm	36 cm	80 square cm
Manav	11 cm	11 cm	44 cm	121 square cm
Aarushi	10 cm	8cm	36 cm	80 square cm
Kabir	10 cm	10 cm	40 cm	100 square cm

My belt is longest:

Take a thick paper sheet of length 14 cm and width 9 cm. You can also use an old postcard.

Question 1 (2)

1. What is its area? What is its perimeter?

Solution

Length of paper sheet = 14 cm

Breadth of paper sheet = 9 cm

Area of the sheet = 14 cm $\times$ 9 cm = 126 square cm

Perimeter of the sheet = 14 cm + 9 cm + 14 cm + 9 cm = 46 cm

Question 2 (2)

2. Now cut strips of equal sizes out of it. Using tape join the strips, end to end, to make a belt.



How long is your belt? _____

Solution

84 cm

Question 3 (2)

3. What is its perimeter _____?

Solution

90 cm

Question 4

Whose belt is the longest in the class? _____

Solution

Strips of the least width will make the longest belt in the class.

Discuss:

Question 1

Why did some of your friends get longer belts than others?

Solution

This is because they made belts from thinner strips than others.

Question 2

Is the area of your belt the same as the area of the postcard? Why or why not?

Solution

Area of the belt of 3 cm wide strip = length $\times$ breadth

$$= 3 \times 42 = 126 \text{ square cm}$$

Yes, the area of my belt is the same as the area of the post card. This is because every area of the post card is used for making the belt.

Question 3

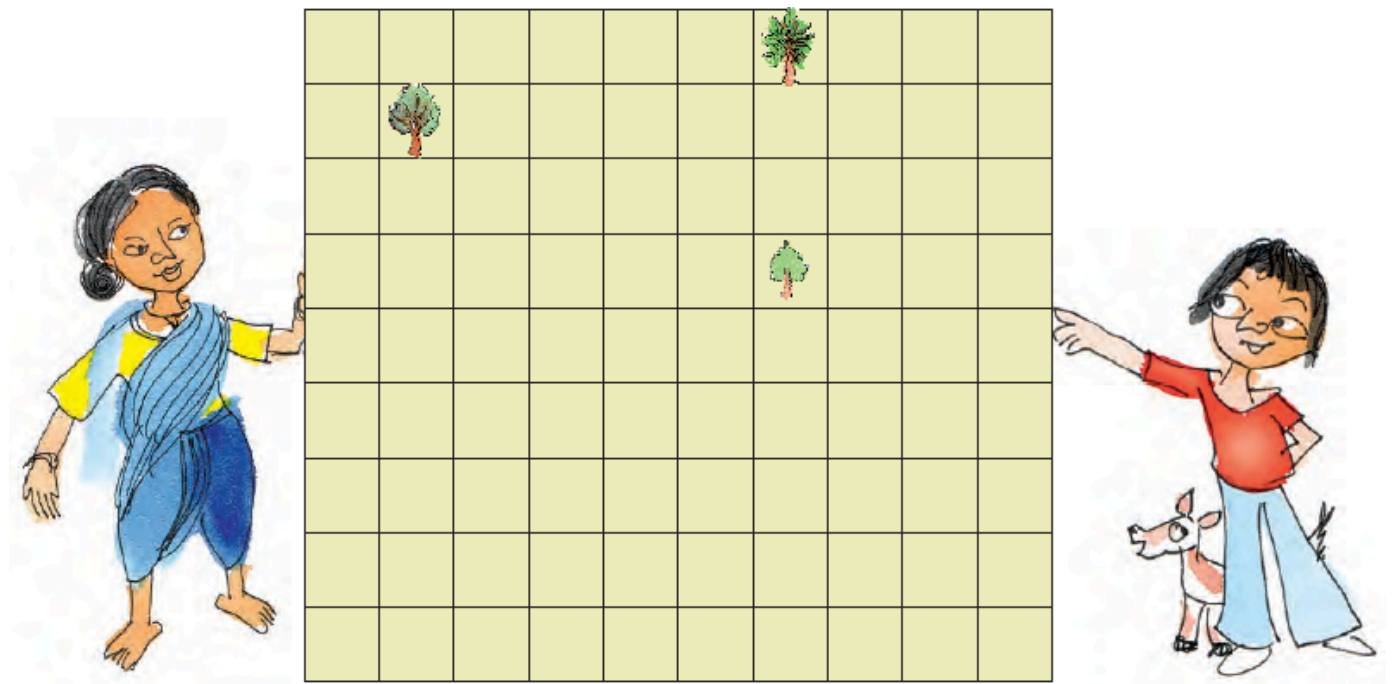
What will you do to get a longer belt next time?

Solution

I can get a longer belt by making thinner belts next time.

Share the land:

Nasreena is a farmer who wants to divide her land equally among her three children — Chumki, Jhumri and Imran. She wants to divide the land so that each piece of land has one tree. Her land looks like this.

**Question 1 (2)**

1. Can you divide the land equally? Show how you will divide it. Remember each person has to get a tree. Colour each person's piece of land differently

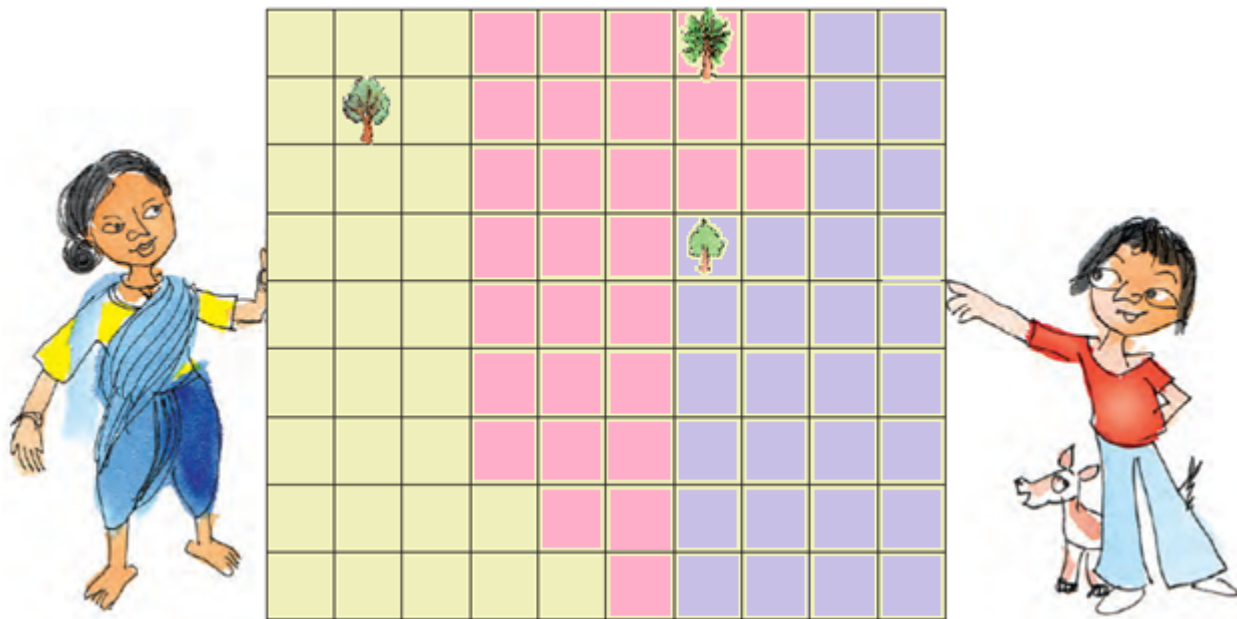
Solution

Total number of boxes = 90

Hence, one person's share is = $90/3$

= 30 boxes.

The division can be done as shown in the given figure:



Question 2 (2)

2. If each square on this page is equal to 1 square metre of land, how much land will each of her children get? _____ Square m

Solution

30 square meter.

Question 3 (2)

3. Chumki, Jhumri and Imran need wire to make a fence.



Who will need the longest wire for fencing? _____

Solution

Perimeter of Chumki's land = $9 + 2 + 3 + 2 + 6 + 4 = 26$ m

Perimeter of Jhumri's land = $6 + 3 + 2 + 3 + 4 + 6 = 24$ m

Perimeter of Imraan's land = $8 + 5 + 3 + 2 + 5 + 3 = 26$ m

So it is clear that Chumki and Imraan need longest wire of fencing.

Question 4

How much wire in all will the three need? _____

Solution

Total length of wire = 26 m + 24 m + 26 m = 76 m.

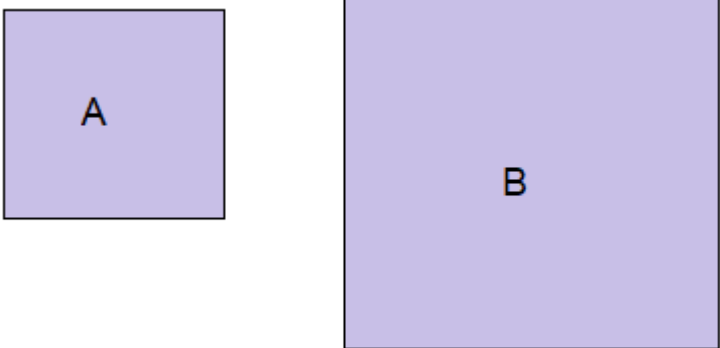
Practice time:

A. Look at the table. If you were to write the area of each of these which column would you choose? Make a (✓)

	Square cm	Square metre	Square km
Handkerchief	✓		
Sari			
Page of your book			
School land			
Total land of a city			
Door of your classroom			
Chair seat			
Blackboard			
Indian flag			
Land over which a river flows			

	Square cm	Square metre	Square km
Handkerchief	✓		
Sari		✓	
Page of your book	✓		
School land		✓	
Total land of a city			✓
Door of your classroom		✓	
Chair seat	✓		
Blackboard		✓	
Indian flag	✓		
Land over which a river flows			✓

B. Draw a square of 9 square cm. Write A on it. Draw another square with double the side. Write B on it



Answer these —

Question 1 (3)

1. The perimeter of square A is _____ cm.

Solution

12 cm

Question 2 (3)

2. The side of square B is _____ cm.

Solution

6 cm

Question 3 (3)

3. The area of square B is _____ square cm.

Solution

36 cm

Question 4 (2)

4. The area of square B is _____ times the area of square A.

Solution

4 times

Question 5

The perimeter of square B is _____ cm.

Solution

24 cm

Question 6

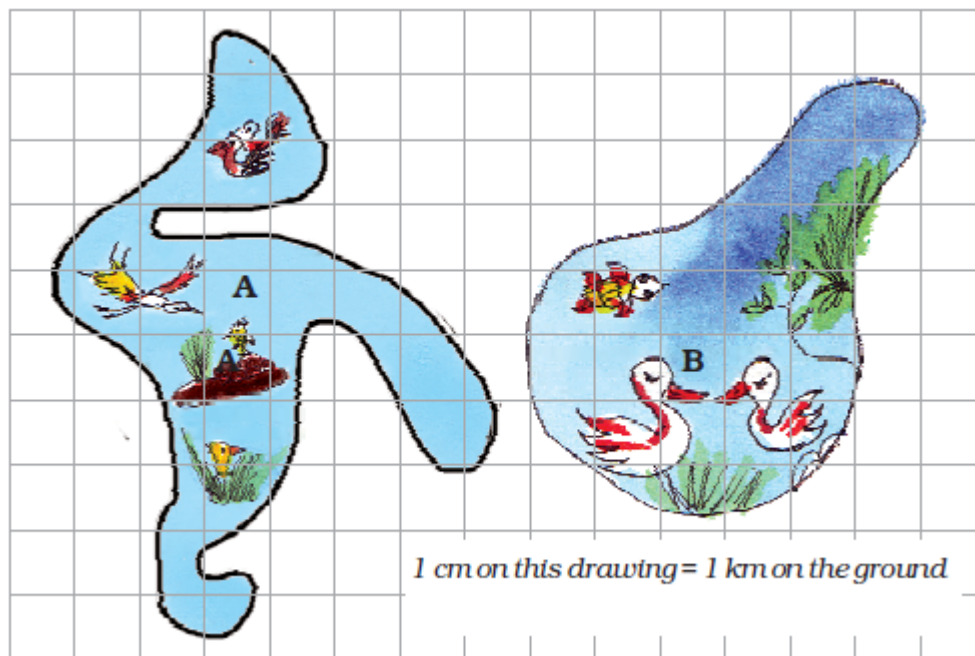
The perimeter of square B is _____ times the perimeter of square A.

Solution

2 times

Save the Birds:

There are two beautiful lakes near a village. People come for boating and picnics in both the lakes. The village Panchayat is worried that with the noise of the boats the birds will stop coming. The Panchayat wants motor boats in only one lake. The other lake will be saved for the birds to make their nests.



a) How many cm is the length of the boundary of Lake A in the drawing? _____ (use thread to find out)

When we measure the boundary of Lake A with the help of thread, it comes out to be around 30 cm.

b) What is the length of the boundary of Lake B in the drawing?

When we measure the boundary of Lake B with the help of thread, it comes out to be around 25 cm.

c) How many kilometers long is the actual boundary of Lake A?

Here, the scale is $1 \text{ cm} = 1 \text{ km}$

So, length of the actual boundary of lake A = 30 km

d) How many kilometers long is the actual boundary of Lake B?

Here, the scale is $1 \text{ cm} = 1 \text{ km}$

So, length of the actual boundary of lake B = 25 km

e) A longer boundary around the lake will help more birds to lay their eggs. So which lake should be kept for birds? Which lake should be used for boats?

The boundary around the lake A is more than the boundary around the lake B. So, Lake A should be kept for birds and Lake B should be used for boats.

f) Find the area of Lake B on the drawing in square cm. What is its actual area in square km?

Lake B has 15 fully filled squares and 11 half-filled or more than half – filled squares. Area of 15 fully filled squares = $15 \times 15 = 225$ square cm

We consider the area of every single half – filled or more than half – filled square as 1 square cm

Thus, the area of 11 such squares = $11 \times 11 = 121$ square cm

So, total area of lake B = $225 + 121 = 346$ square cm

We are given 1 cm on drawing = 1 km on ground

Therefore, 346 square cm on drawing = 346 km

King's Story:

The King was very happy with carpenters Cheggu and Anar. They had made a very big and beautiful bed for him. So as gifts the king wanted to give some land to Cheggu, and some gold to Anar. King's Story Cheggu was happy. He took 100 metres of wire and tried to make different rectangles. He made a 10 m $\times$ 40 m rectangle. Its area was 400 square metres. So he next made a 30 m $\times$ 20 m rectangle.



Question 1 (4)

1. What is its area? Is it more than the first rectangle?

Solution

Area of rectangle = $30 \times 20 = 600$ square m.

Yes, it is more than the first rectangle.

Question 2 (4)

2. What other rectangles can he make with 100 metres of wire? Discuss which of these rectangles will have the biggest area.

Solution

Following rectangles are possible:

$$5 \times 45 = 225 \text{ square m}$$

$$15 \times 35 = 525 \text{ square m}$$

$$25 \times 25 = 625 \text{ square m}$$

The square will have the biggest area.

Question 3 (4)

3. Cheggu's wife asked him to make a circle with the wire. She knew it had an area of 800 square metres. Why did Cheggu not choose a rectangle? Explain.

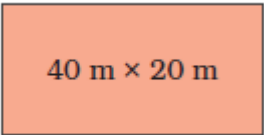
Solution

Because none of the rectangles will have area of 800 square meter.

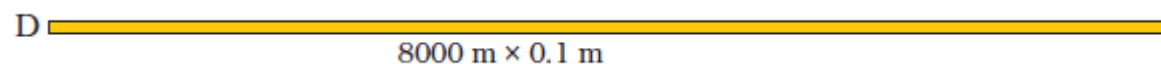
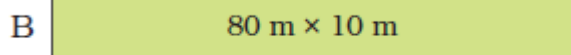
Question 4 (3)

4. So Anar also tried many different ways to make a boundary for 800 square metres of land. He made rectangles A, B and C of different sizes. Find out the length of the boundary of each. How much gold wire will he get for these rectangles?

A



40 m $\times$ 20 m



i. Gold wire for A = _____ metres

Solution

As the area of rectangle A is shown as 40 m × 20 m.

So, the length of rectangle = 40 m Width of rectangle = 20 m

Gold wire for A = $40 + 20 + 40 + 20 = 120$ metres

ii. Gold wire for B = _____ metres

As the area of rectangle B is shown as 80 m × 10 m.

So, the length of rectangle = 80 m Width of rectangle = 10 m

Gold wire for B = $80 + 10 + 80 + 10 = 180$ metres

iii. Gold wire for C = _____ metres

As the area of rectangle C is shown as 800 m × 1 m.

So, the length of rectangle = 800 m width of rectangle = 1 m

Gold wire for C = $800 + 1 + 800 + 1 = 1602$ metres

iv. So he will get _____ metres of gold wire!!

As the area of rectangle D is shown as 8000 m × 0.1 m.

So, the length of rectangle = 8000 m

Width of rectangle = 0.1 m

Gold wire for C = $8000 + 0.1 + 8000 + 0.1 = 16000 + 0.2 = 16000.2$ metres.

So, he will get 16000.2 metres of gold wire.