



12. Perimeter and Area

Perimeter

Sita : Salma, will you come to the market with me to buy lace?

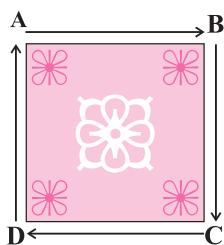
Salma : Why do you need lace?

Sita : I have a handkerchief. I want to trim it with lace.

Salma : How much lace do you need?

Sita : Oh yes! How much lace do I need?

Salma : Let us take a spool of thread. Hold one end of the thread at one corner of the handkerchief. Then, slowly unwind the thread along all four of its sides until you reach the first corner. Cut it there. You will know how much lace you need by the length of the thread you have cut off.



ABCD is a square handkerchief. The sum of the length of sides AB, BC, CD and DA is the length of lace needed. This length is called the perimeter of the handkerchief.

The perimeter of a square is the sum of the length of all four sides of the square.

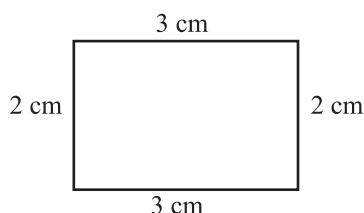


A fence of a single wire has to be put around a rectangular field. We have to find out the length of the wire needed. The sum of the lengths of all four sides of the rectangular field will tell us the length of wire needed.

The perimeter of a rectangle is the sum of the length of all four sides of the rectangle.

This is a triangle made of wire. To find out the length of the wire needed to make it, we will straighten out the wire and measure its length. This length will be the sum of the length of the three sides of the triangle.

The perimeter of a triangle is the sum of the length of all three sides of the triangle.

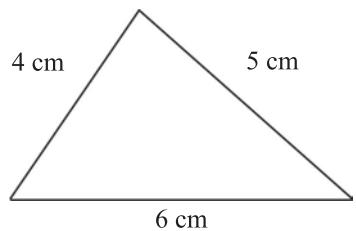
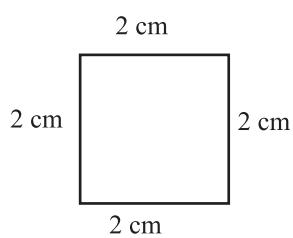


This figure shows a rectangle whose sides are 3cm, 2cm, 3cm and 2 cm. Let us find out its perimeter.

The perimeter of a rectangle is the sum of the length of all four of its sides.

$$3 + 2 + 3 + 2 = 10.$$

Therefore, the perimeter of this rectangle is 10 cm.



The figure alongside is a square and all of its sides are 2 cm long. Let us find the perimeter of the square. The perimeter of a square is the sum of the length of its four sides.

$$2 + 2 + 2 + 2 = 8.$$

Therefore, the perimeter of the square = 8 cm.

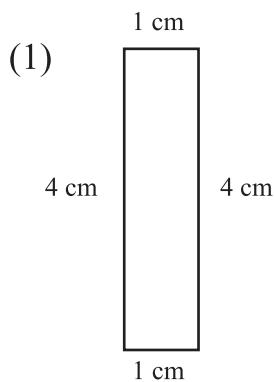
The sides of the triangle here are 4 cm, 5 cm and 6 cm long. Let us find out the perimeter of the triangle. The perimeter of a triangle is the sum of the length of all three of its sides.

$$4 + 5 + 6 = 15.$$

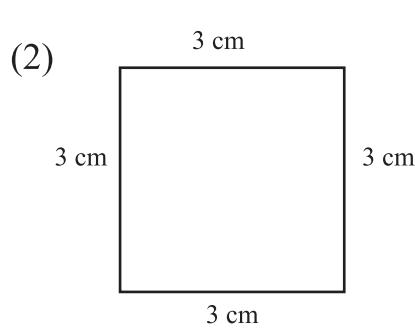
Therefore, the perimeter of this triangle = 15 cm.

Exercise

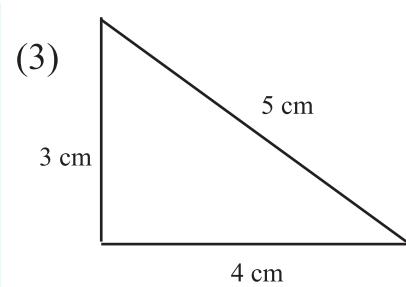
1. Find the perimeter of the figures given below.



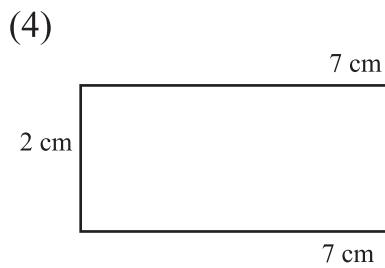
$$\text{Perimeter} = \boxed{\quad} \text{ cm}$$



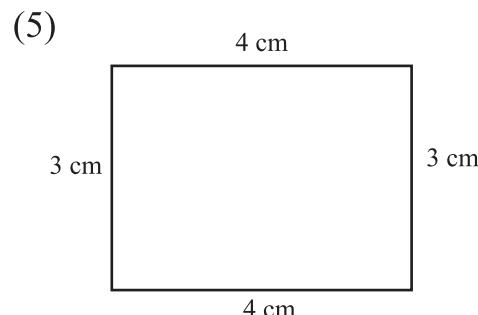
$$\text{Perimeter} = \boxed{\quad} \text{ cm}$$



$$\text{Perimeter} = \boxed{\quad} \text{ cm}$$



$$\text{Perimeter} = \boxed{\quad} \text{ cm}$$



$$\text{Perimeter} = \boxed{\quad} \text{ cm}$$

2. The sides of a rectangular field are 150m, 120m, 150m and 120m. Find the perimeter of the field.

Area



Saina : I have more chikki than you.

Virat : I have more chikki than you.

Sumatai : Stop! Don't fight. Saina, why don't you count the number of chikki squares you have?

Saina : I have 16 squares of chikki.

Sumatai : Now, Virat, you count the number of chikki squares that you have.

Virat : I have 16 squares of chikki, too.

Sumatai : Now tell me, who has more chikki?

Saina : We were fighting over nothing, Tai. We both have the same amount of chikki.

Sumatai : That's right. But, let me explain it to you properly. The thickness of the squares of chikki you both have is the same. So, let us measure their surfaces. There are 16 squares of equal measure on both your slabs. Therefore, you both got the same amount of chikki.

On any surface, the measure of the place occupied by a figure is the area of that figure.

The measure of a figure should be the same no matter who measures it. Hence, 'a square of side 1 cm' is used as the standard unit of measurement of area. The area of a figure is given in square centimetres (sq cm).



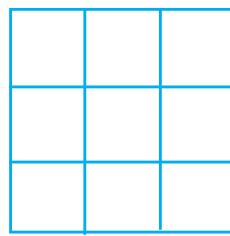
To find out the area of this rectangular piece of paper, let us count the number of squares with sides of 1 cm on the paper. There are 10 such squares on the paper.

Therefore, the area of the paper is 10 sq cm.

To find out the area of the shape given alongside, let us count the number of squares with sides 1 cm, in it.

Area of the shape = number of squares = 9

Therefore, area of the shape = 9 sq cm.





A big rectangular table is 3 metres long and 2 metres wide. The surface of the table is to be laminated and a border tape has to be fitted along its sides. For this, we must find out how much laminate and what length of border tape is required. The laminate will occupy the top surface of the table. Therefore, to find out how much laminate is needed, we must find the area of the table top.

The border tape will be fitted along the sides of the surface. Hence, to find out the length of border tape needed, we find the perimeter of the table top.

Here, the size of the table is large. So, to find the area, let us use squares with sides of length 1 metre.

A square with side 1 metre has an area of 1 square metre.

$$\begin{aligned}
 \text{Measurement of laminate} &= \text{Area of the table top} \\
 &= \text{Number of squares occupying the table top} \\
 &= 6
 \end{aligned}$$

Therefore, the quantity of laminate needed is 6 square metres.

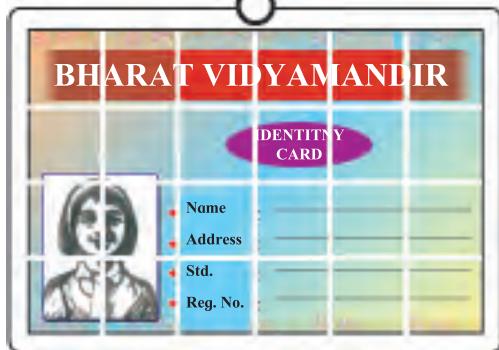
$$\begin{aligned}
 \text{Length of border tape} &= \text{Perimeter of the surface of the table} \\
 &= \text{Sum of the length of all four sides of the surface} \\
 &= 2 + 3 + 2 + 3 \\
 &= 10
 \end{aligned}$$

Therefore, the length of border tape needed is 10 metres.

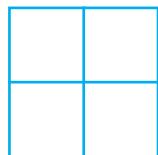
Exercise

Find the area of the following figures (all small squares are of 1 sq cm area).

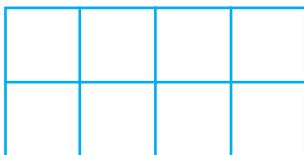
(1)



(2)



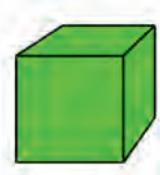
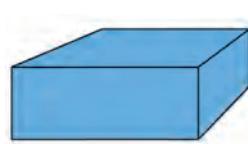
(3)



(4)



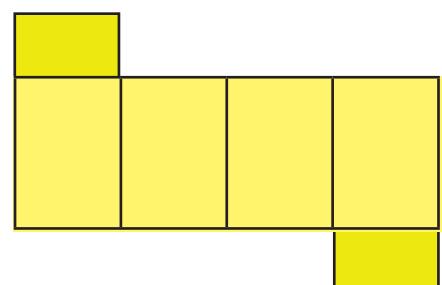
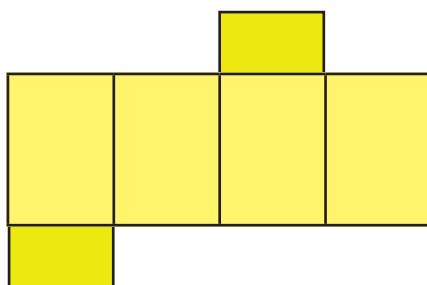
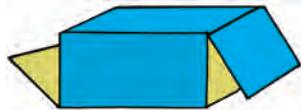
Constructing boxes (Packaging nets)



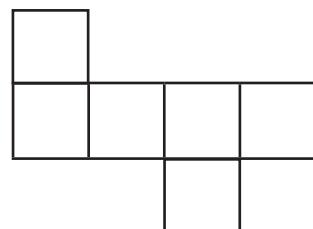
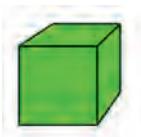
Nandu : Anand, look at these cardboard boxes. How do you think they are made?

Anand : Let us cut one of the boxes and lay it out flat. Then we will know how it is made.

Aditi : If we cut along different lines, will we get a different kind of box ? Let us see.

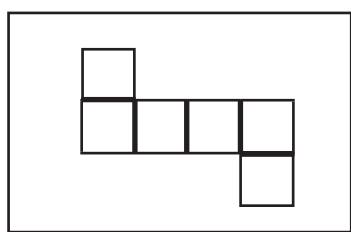


Anand : Let us open up this smaller box with a different shape.

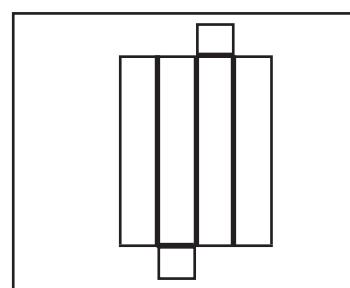


◆ Try this out.

◆ Take a piece of thick rectangular paper. Draw six joined squares as shown in the picture.



◆ Take a rectangular piece of thick paper. Draw six joined rectangles as shown in the picture.



Cut out the remaining paper. Fold the squares and rectangles along the thick lines to make boxes.

◆ Collect boxes of different shapes used to store different things. Open them up and study their structure.