

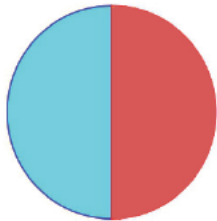
# 5

## PART NUMBER

### Half means

After eating two dosas, Mini said, “Just half a dosa more, Ma!”

Look at the picture:



Half of the circle is blue and half of the circle is red.

What about this line?



Again, half of the line is blue and half of the line is red.

And if the length of the line is one metre, we can say half a metre blue and half a metre red.



## Standard V - Mathematics

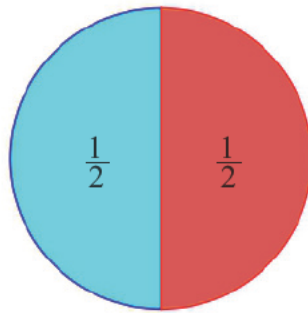
If one litre milk is shared equally between two children, how much does each get?

Half a litre, right?

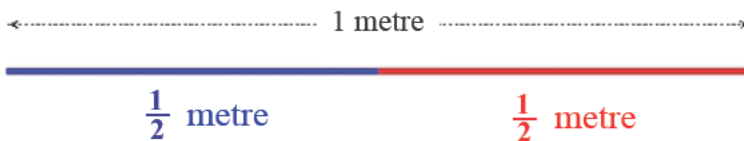
Half means one of two equal parts. We write it as  $\frac{1}{2}$ .

Thus

- Mini wants  $\frac{1}{2}$  of a dosa.
- $\frac{1}{2}$  of the circle is colored blue,  $\frac{1}{2}$  red.

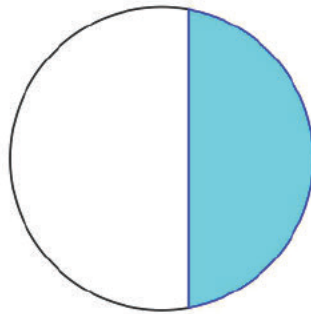


- Half of a metre is  $\frac{1}{2}$  metre.



- Half a litre is  $\frac{1}{2}$  litre.

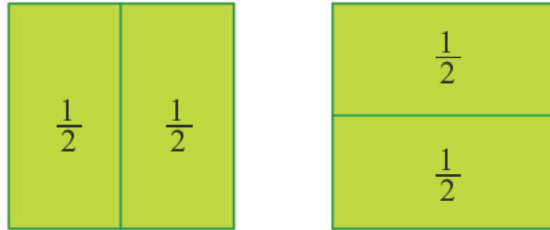
Now look at the picture:



Is the coloured part  $\frac{1}{2}$  of the circle?

The parts are not the same, are they?

Look at the pictures:

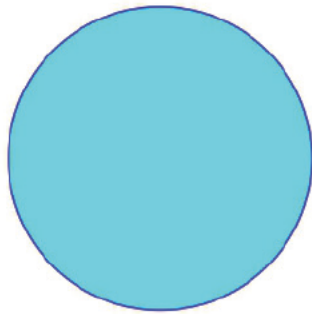


$\frac{1}{2}$  of a square is marked in two different ways.

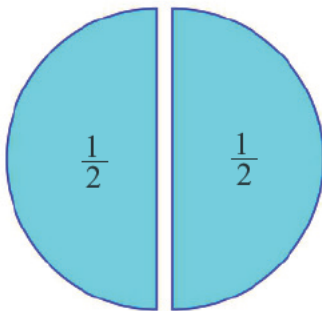
Any other way to split a square into halves? Think about it

### Half in many ways

Draw a circle in paper and cut it out:

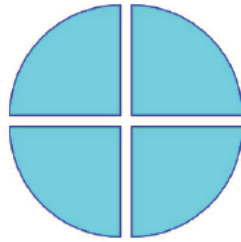


Folding it right through the middle and cutting makes two halves.



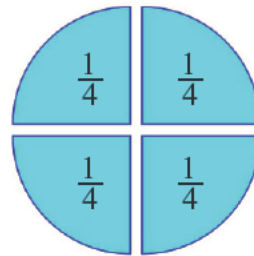
**Standard V - Mathematics**

What will we get if we fold and cut each of these pieces through the middle?

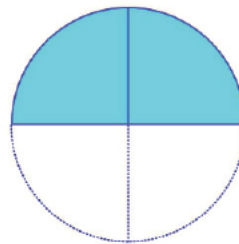


Each of these four little pieces is one of four equal parts of the circle, isn't it?

So, we can call each one fourth of the circle and write  $\frac{1}{4}$  of the circle

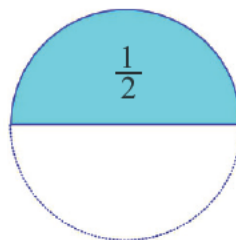
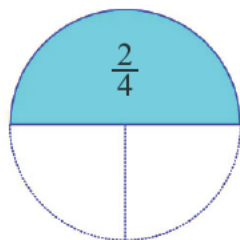


Suppose we join two of them together



It's two of the four equal parts of the circle, right? So, we can call it two fourths of the circle; and write  $\frac{2}{4}$  of the circle.

But it is also  $\frac{1}{2}$  of the circle, isn't it?

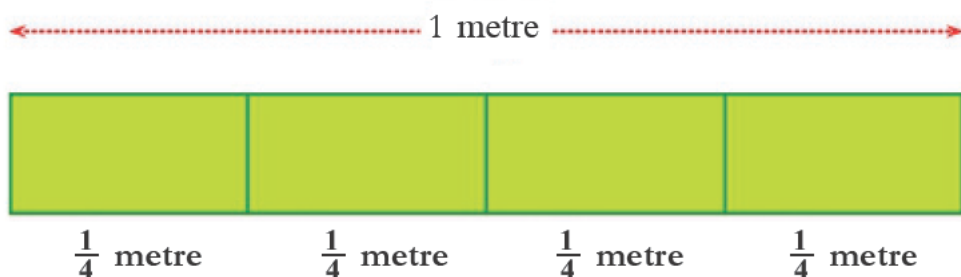


Whether we take two of four equal parts or one of two equal parts, what we get is half; that is to say, two fourth is the same as half. In the language of math.

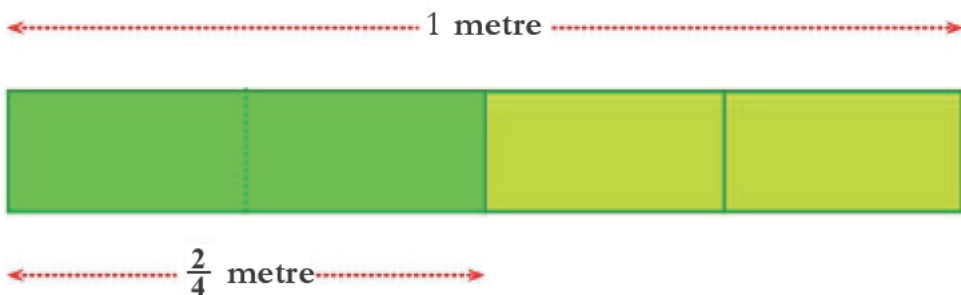
$$\frac{2}{4} = \frac{1}{2}$$

Let's consider another example.

If a one metre long ribbon is cut into four equal pieces, each part is  $\frac{1}{4}$  metre long:

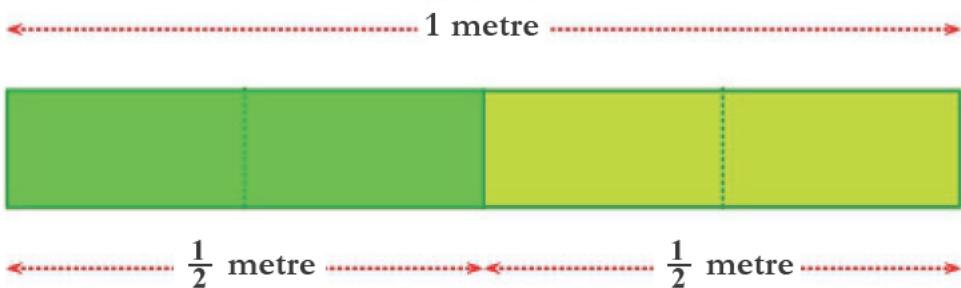


Suppose we take two parts together:



Since it is got by joining 2 of the 4 equal parts into which one metre is cut, we can say it is  $\frac{2}{4}$  metre.

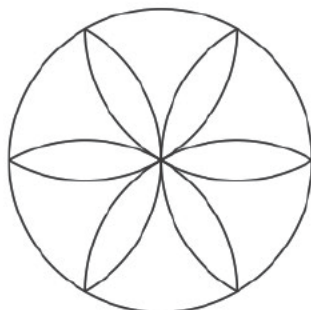
Since it is half of 1 metre, it may be better to say  $\frac{1}{2}$  metre (and easier to understand also).



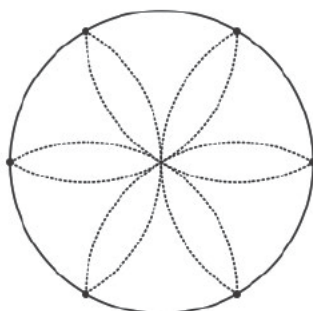
**Standard V - Mathematics**

Let's have some more circles.

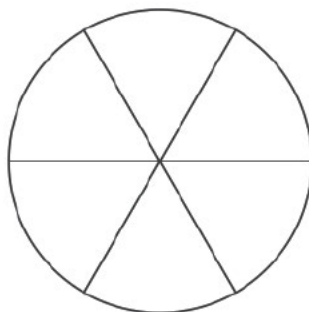
Do you remember this picture from the lesson, Lines and Circles?



We can mark six points on the circle in this:



Joining these points to the centre, we get a picture like this:

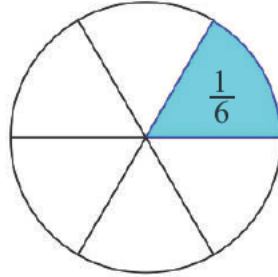


How many parts of the circle do we get?

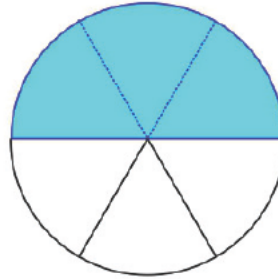
Are they all of the same size? (If you are not convinced, Draw a picture on a thick sheet of paper, cut out the pieces and check by stacking up the pieces).



We say each piece is one sixth of the circle, and write  $\frac{1}{6}$  of the circle.



In the above picture, to colour half the circle, how many more pieces should we colour?



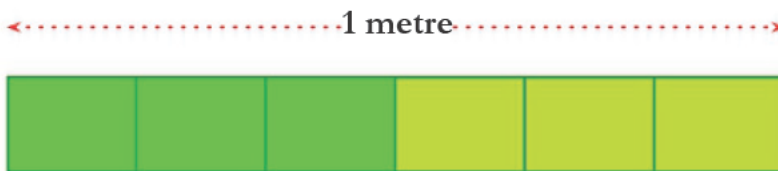
Out of the six equal parts, how many are coloured now? So, what part of the circle can we say is coloured? How do we write it?

How do we write in the language of math that this is half the circle?

$$\frac{3}{6} = \frac{1}{2}$$

Thus three sixth is also half.

We can also see this by cutting a one metre long ribbon into six equal pieces and joining three of them together:



$$\frac{3}{6} \text{ metre}$$



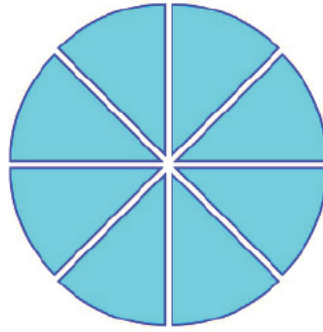
$$\frac{1}{2} \text{ metre}$$

**Standard V - Mathematics**

How many pieces will we get if we fold and cut through the middle of the four equal pieces of the circle?

What part of the circle we say each is?

And how do we write it?



How many such pieces must be joined together to get half the circle?

So what's another way of saying half?

How do we write it?

Let's make a table of the different forms of 'half' we've seen:

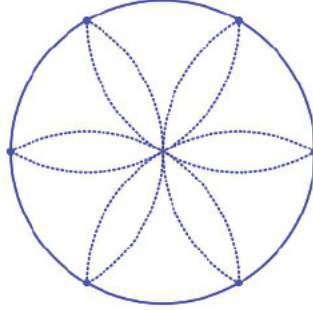
Half			
Parts cut	Parts taken	Said	Written
2	1	Half	$\frac{1}{2}$
4	2	Two fourths	$\frac{2}{4}$
6			
8			

Can't you fill up the empty cells ?

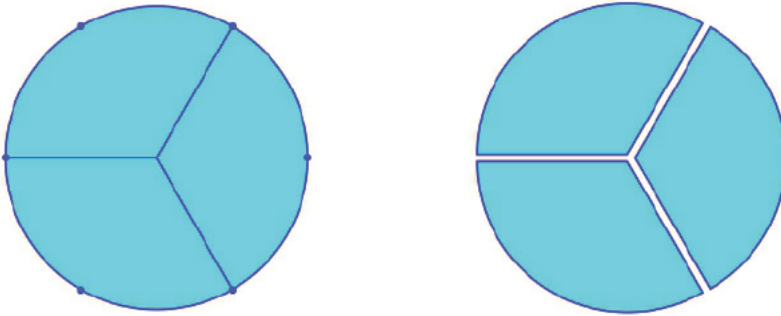


## Three parts

Don't you remember marking six points on the circle to cut it into six equal parts?

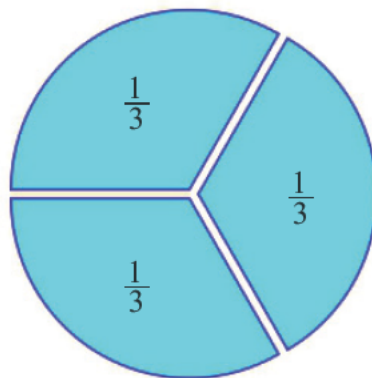


Draw a circle on a thick sheet of paper and mark these six points. Join only the alternate points with the centre. First cut out the circle and then cut along these lines.



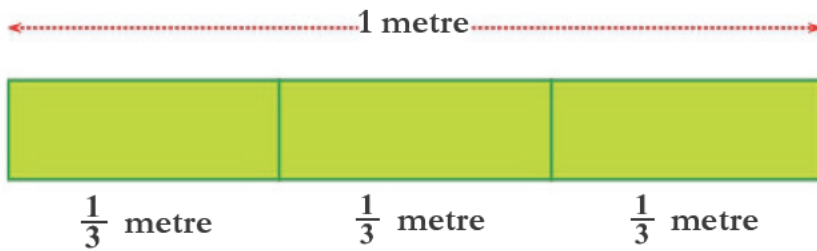
Put these pieces one over another and check. Aren't they all of the same size?

Each piece is said to be one third of the circle; and we write  $\frac{1}{3}$  of the circle:



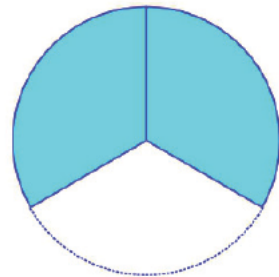
## Standard V - Mathematics

If a 1 metre long ribbon is cut into three equal pieces, the length of each is  $\frac{1}{3}$  metre.



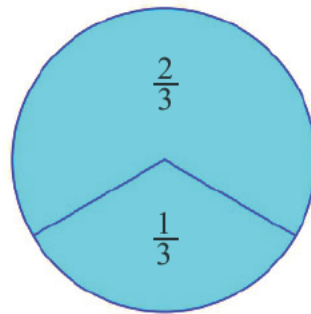
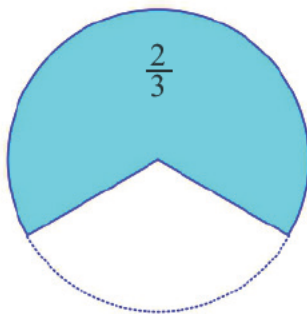
If one litre of milk is shared by three, how much will each get?

If we put together two of the three equal parts into which a circle is cut, what part of the circle would it make?

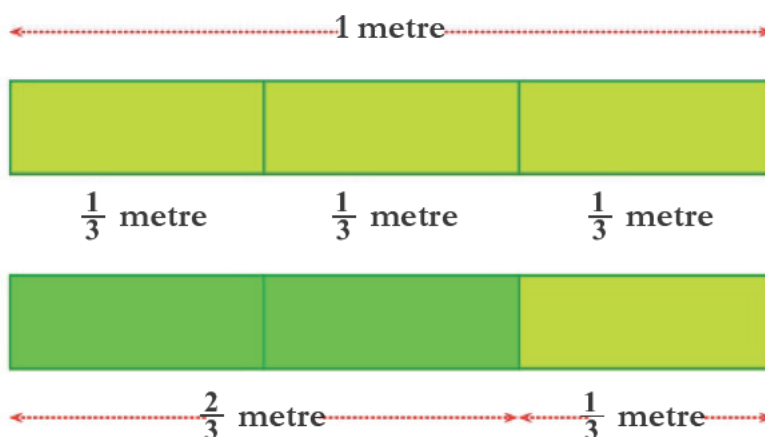


It's two of the three equal parts of the circle which has been cut into three.

It is said to be two thirds of the circle, written  $\frac{2}{3}$  of the circle.



Like this, let's put together two of the three equal pieces into which a one metre long ribbon is cut:

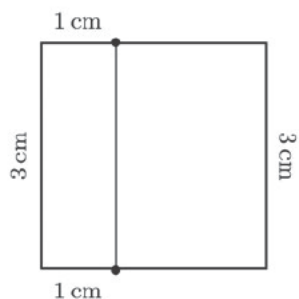




Now let's try these on your own:

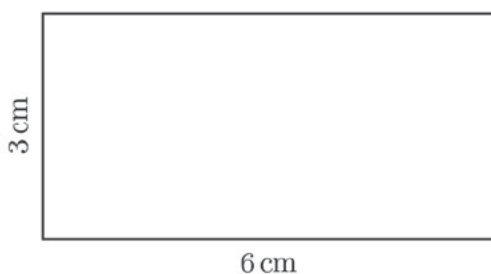
1. Draw a square with each side 3 centimetres.

Mark off 1 centimeter from the left on the top and bottom sides, and join them.



- i.* What part of the square is the smaller rectangle?
- ii.* And the larger?
- iii.* Colour the  $\frac{1}{3}$  part with red and the  $\frac{2}{3}$  part with green.
- iv.* Is there another way of dividing the square into  $\frac{1}{3}$  and  $\frac{2}{3}$  parts?

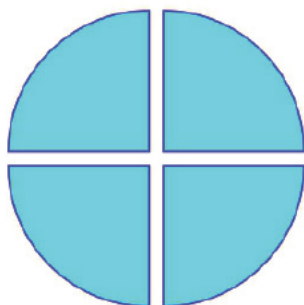
2. Draw a rectangle like this:



Colour  $\frac{2}{3}$  of it with green and,  $\frac{1}{3}$  with red.

### Other parts

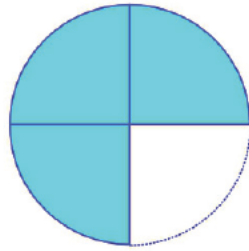
We've seen how to divide a circle into four equal parts:



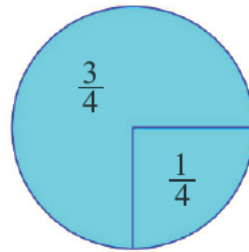
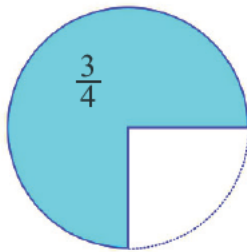
**Standard V - Mathematics**

And also that two of the pieces together make half the circle.

What if we put together three of the pieces?

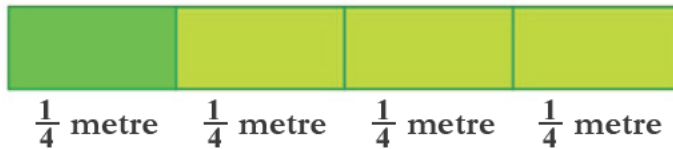


Since it's three of the four equal parts of the circle, we can say it's three fourths of the circle, and write  $\frac{3}{4}$  of the circle:



See the different lengths we get by putting together different number of pieces got by dividing a one metre long ribbon into four equal parts:

← 1 metre →



← 1 metre →



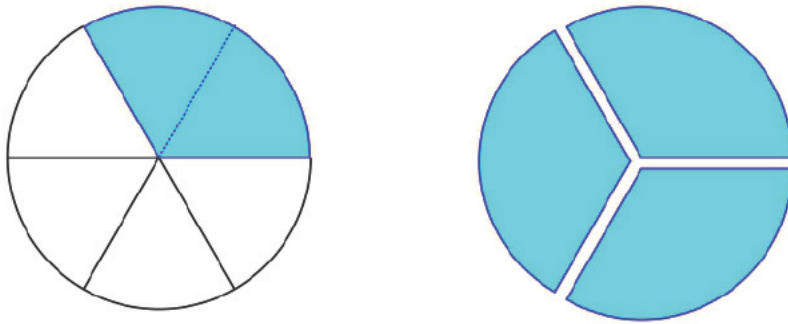
← 1 metre →



One fourth is usually called a quarter and three fourths, three quarters. So, the lengths in the picture above can be called quarter metre, half metre and three quarters metre.

Another question: if three of the six equal parts into which a circle is divided are coloured, then half the circle is coloured; what if we colour only two parts?

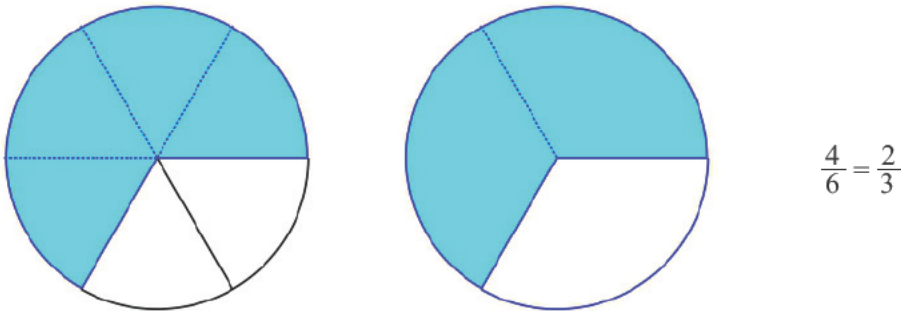
Put on the top of this coloured part, one of the three equal pieces into which the circle is divided and see:



Thus two sixths is the same as one third:

$$\frac{2}{6} = \frac{1}{3}$$

Like this, colour four of these six parts and compare with two of the three equal parts:



$$\frac{4}{6} = \frac{2}{3}$$

We can also join different number of pieces of a one metre ribbon cut into six pieces, and compare them with the pieces of another one metre ribbon cut into three equal parts.

←.....1 metre.....→



$\frac{1}{6}$  metre  $\frac{1}{6}$  metre  $\frac{1}{6}$  metre  $\frac{1}{6}$  metre  $\frac{1}{6}$  metre  $\frac{1}{6}$  metre



$\frac{1}{3}$  metre  $\frac{1}{3}$  metre  $\frac{1}{3}$  metre



$\frac{2}{6}$  metre



$\frac{1}{3}$  metre



$\frac{4}{6}$  metre



$\frac{2}{3}$  metre

The numbers like  $\frac{1}{2}$ ,  $\frac{1}{3}$ ,  $\frac{2}{3}$ ,  $\frac{1}{4}$ ,  $\frac{3}{4}$ , ..... used to denote parts of a whole are called fractions.

What have you so far learnt about fractions?

- We say half, one third, two third and so on in common language when we divide something into equal parts and take only some of the pieces.

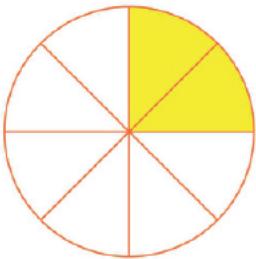


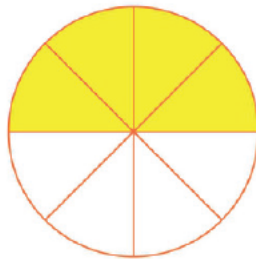
- \* One of the two equal parts of a dosa is half a dosa.
- \* If one litre of milk is used to fill three bottles of the same size, then each bottle contains one third of a litre
- \* If a one metre long ribbon is folded into three equal parts and two of them are cut off together, the length of that piece is two third of a metre
- Fractions are used to talk about these parts in the language of math
  - \*  $\frac{1}{2}$  dosa     \*  $\frac{1}{3}$  litre     \*  $\frac{2}{3}$  metre
- Fraction in different forms may be the same part:
  - \* Cut a dosa into four equal pieces and take two pieces; or cut it into two equal pieces and take one piece. In either case we have half a dosa:  $\frac{2}{4} = \frac{1}{2}$
  - \* Fill six bottles of the same size with one litre of milk and take two bottles; or fill three bottles of the same size with one litre of milk and take one bottle. In either case we get one third of a litre:  $\frac{2}{6} = \frac{1}{3}$ .
  - \* Fold a one metre long ribbon into six equal parts and cut off four of these parts together; or fold a one metre long ribbon into three equal parts and cut off two of these parts together. In either case we get a piece, which is two third of a metre long:  $\frac{4}{6} = \frac{2}{3}$ .

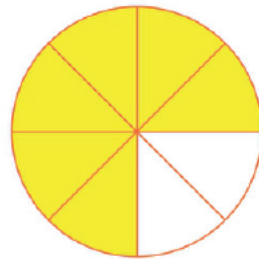


Now let's try these problems.

1. The pictures below show a circle divided into eight equal parts and coloured two at a time:



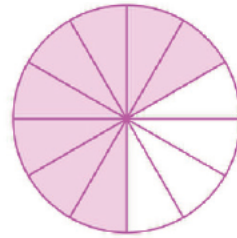
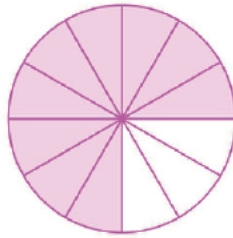
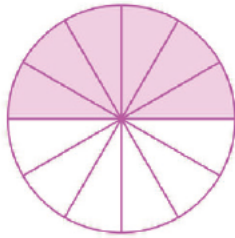
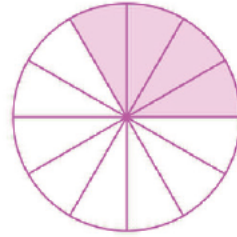
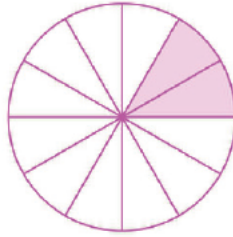
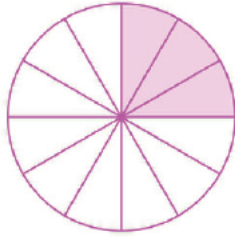





Describe the coloured part of each in two different ways and write both of them as fractions in the box below each picture.

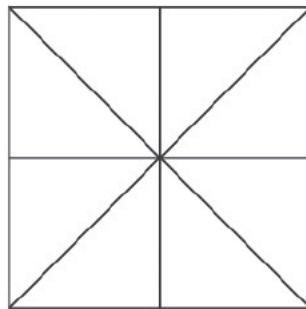
**Standard V - Mathematics**

2. The pictures below show circles divided into twelve equal parts with some of the parts coloured:



Describe the coloured part of each in two different ways and write both of them as fractions in the box below each picture

3. Draw a square and divide it as shown below:



Colour  $\frac{1}{8}$  of the square with red,  $\frac{1}{4}$  with green and  $\frac{1}{2}$  with blue.

- i. Is there any part left uncoloured?
- ii. What part of the whole square is it?
- iii. Write it as a fraction.

## Whole and part

Haven't you heard people saying one and a half litres of milk, one and a quarter metres of cloth, two and a half kilograms of beans, and so on.

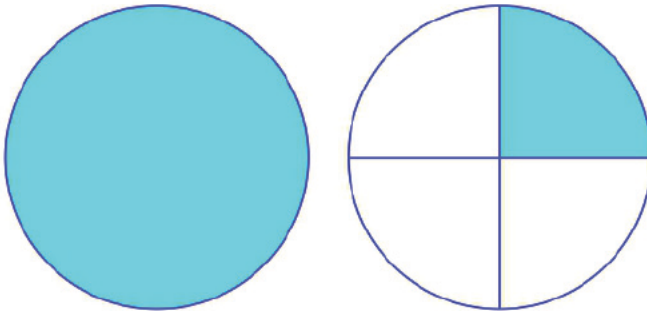
What do these mean?

Suppose one litre of milk is poured into a pot and then half a litre more. How much does it contain now?

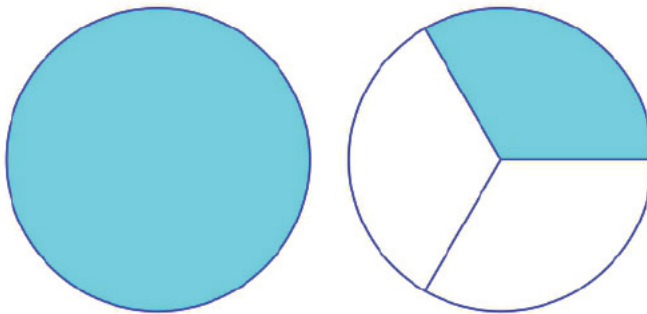
One litre and half a litre together make one and a half litres. We write it as  $1\frac{1}{2}$  litres.

If two litres and quarter of a litre are taken together, that make two and a quarter litres, written  $2\frac{1}{4}$  litres.

Look at these pictures:



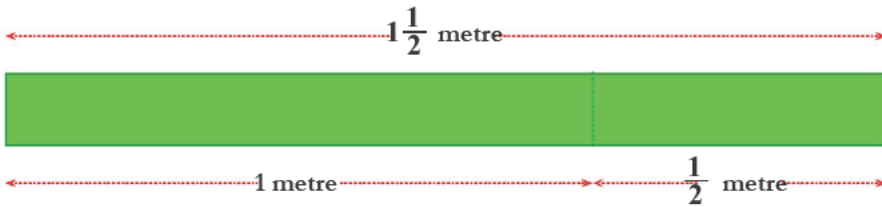
What fraction of the second circle is coloured? So, we can say,  $1\frac{1}{4}$  circles are coloured. What about this picture?



Standard V - Mathematics

One and one third is written  $1\frac{1}{3}$ .

We can also have lengths like these. If a one metre long ribbon and half of another one metre long ribbon are joined end to end, the length is  $1\frac{1}{2}$  metres.



In each of the pictures below, find how much is coloured and write it as a fraction in the box on the right.





