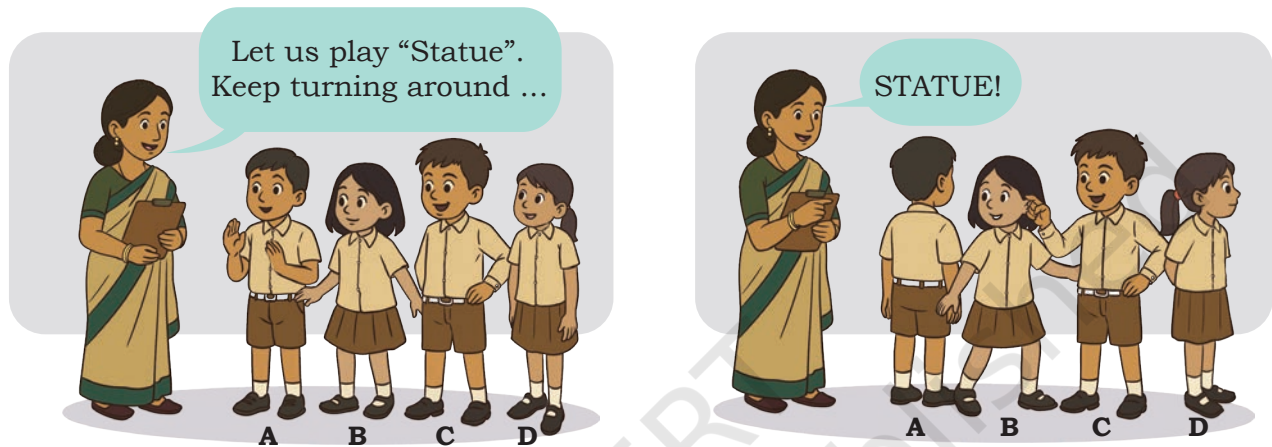




Can you recognise the child in the picture who has made a full turn? Who has made a half turn? How do you know? Discuss in class.



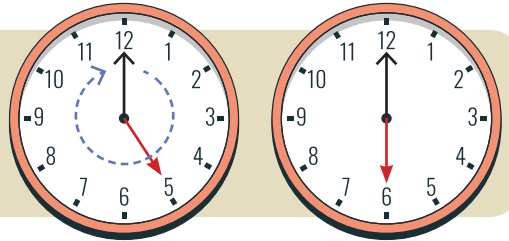
Give examples of real-life situations where you observe turns.



Ashutosh and Sahana are making circles, each having one foot fixed and rotating at one spot on the ground.

Ashutosh made a complete circle by making a full turn. Sahana is making a half-moon shape with a half turn.

The minute hand makes a full turn when it comes back to the initial position.



Note for Teachers: Encourage the learners to play the “statue” game. Learners can be asked to rotate themselves around and stop as the teacher announces “statue”. The learners can notice how much they have turned with respect to their original position.

A giant wheel makes a full turn when it comes back to the starting position E.

Reema takes two half turns in the same direction.

It is like a _____ turn.

What happens if she takes 2 quarter turns in the same direction?

It is like a _____ turn.

What happens if she takes 4 quarter turns in the same direction?

It is like a _____ turn.



Write some of the everyday objects that involve turns. For example, taps, _____, _____, _____, _____, and _____.

What is the maximum possible turn in each of these cases? Check and tick.

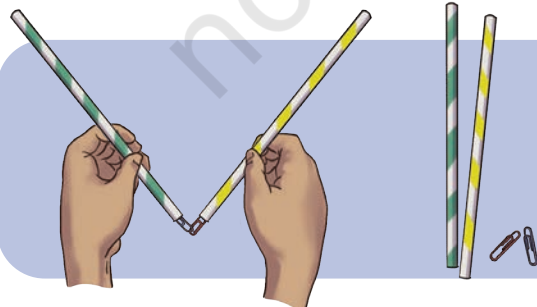
Object	Less than a $\frac{1}{4}$ turn	$\frac{1}{4}$ turn	More than a $\frac{1}{4}$ turn
Clothes clip			
Door with hinge			
Tongs			
Scissors			
File cover			

- Do any of the above objects make a half turn? Write their names below—

.....

- Do any of the above objects make a full turn? Write their names below—

.....



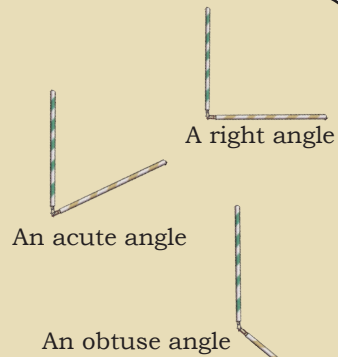
Pragya joined a green and yellow straw with paper clips. She holds the green straw steady and turns the yellow straw around. Observe different turns of the yellow straw.

I made a quarter ($\frac{1}{4}$) of a full turn, so it looks like a right angle.

I made less than a quarter turn, so it looks like an acute angle.

Now I made more than a quarter turn, but less than a half turn. That looks like an obtuse angle.

I made two quarter turns. I wonder what it is called?

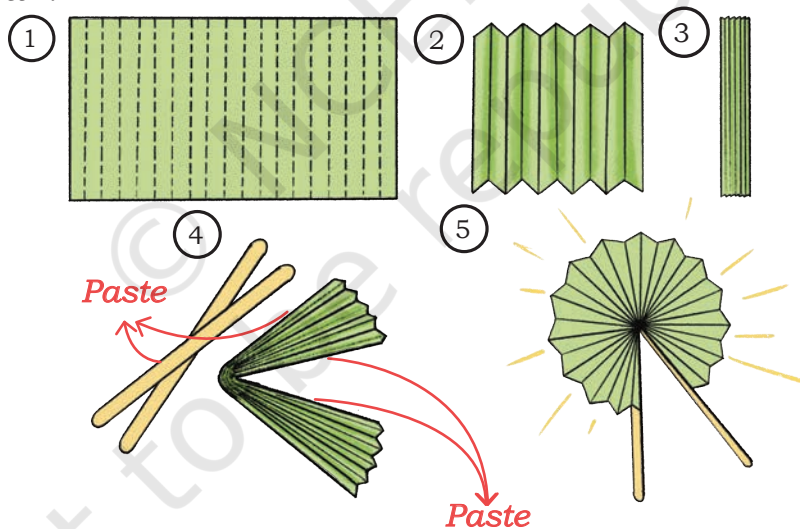


It is a straight angle.

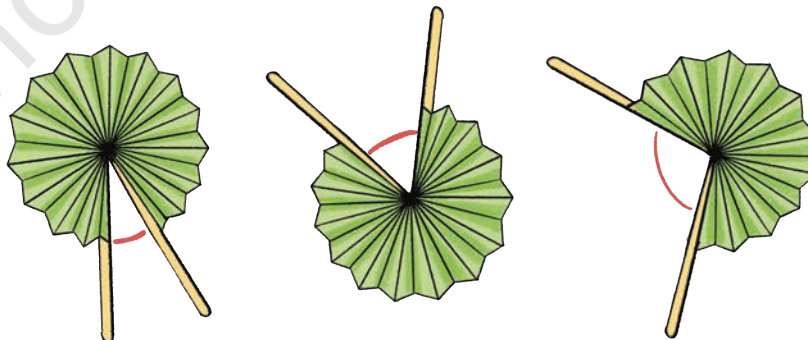
Angles arise in situations that involve a turn.

Let Us Do

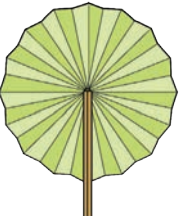
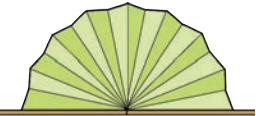
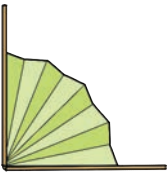
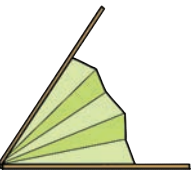

- (a) Making a paper fan. Take a rectangular paper, fold every 2 cm as shown in the picture. Paste ice cream sticks as shown below to create a paper fan.



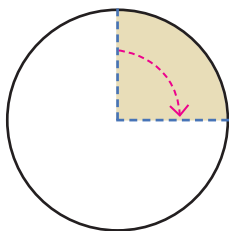
Use your paper fan to show different acute angles and obtuse angles.



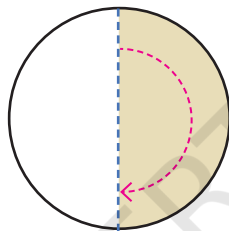
Let us look at the turns made by the paper fan, keeping one side fixed.

Full turn	$\frac{1}{2}$ turn (straight angle)	$\frac{1}{4}$ turn (right angle)	Less than a $\frac{1}{4}$ turn (acute angle)	Between a $\frac{1}{4}$ and $\frac{1}{2}$ turn (obtuse angle)
				

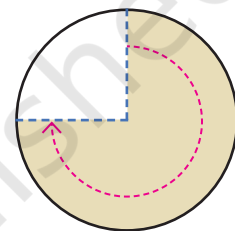
Make an acute turn with the straws or fan. Continue to make another acute turn. Can the two acute turns together make another acute turn?



This shows a $\frac{1}{4}$ turn, or a right angle.



This shows a $\frac{1}{2}$ turn, or a straight angle.



This shows a $\frac{3}{4}$ turn, which is more than a straight angle.

- (b) You might have built houses using the hard covers of notebooks or cardboard pieces.

Look at the angles marked in the house. What angles are you able to see in this house?

Write your answers as right, acute or obtuse angle.

A: _____ B: _____

C: _____ D: _____

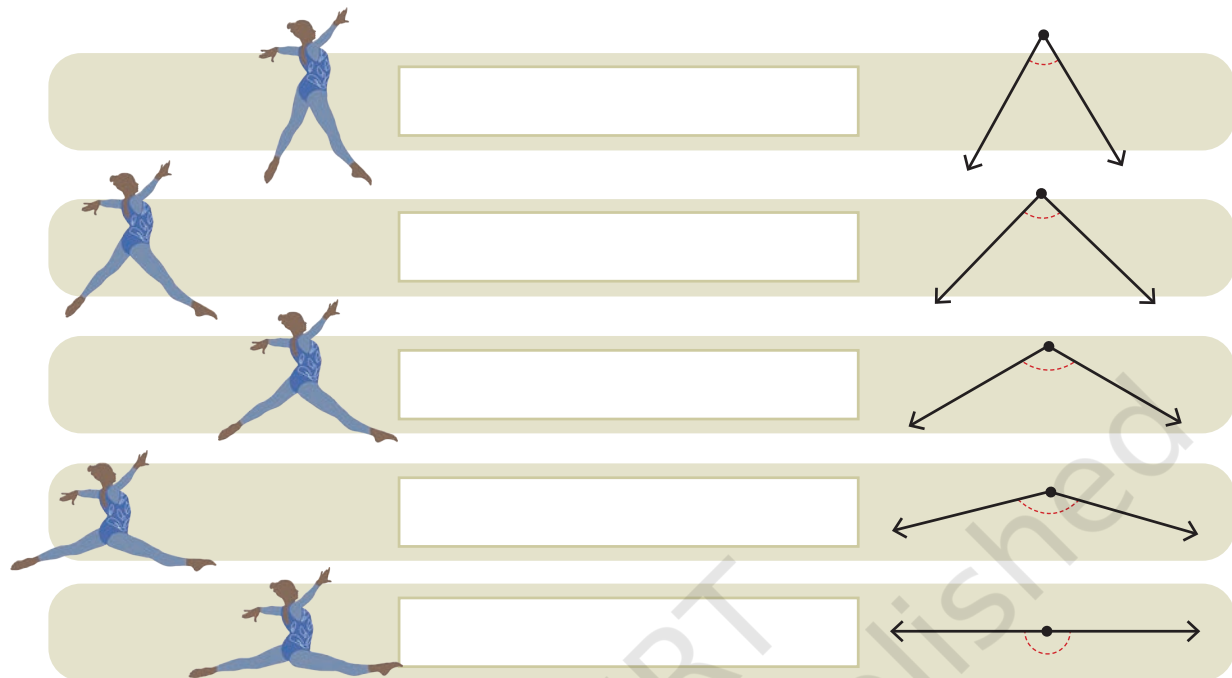
E: _____ F: _____

G: _____ H: _____



- (c) Make a 5-sided shape with 2 right angles, 2 obtuse angles, and 1 acute angle in your notebook.

- (d) Look at the angle formation between the legs of these gymnasts. Identify whether the angles are acute, obtuse, right or straight.



Angle Measuring Tool

Let us make our tool to measure turns.

- (a) Cut out a circle from a tracing paper and fold it to make 8 equal parts.

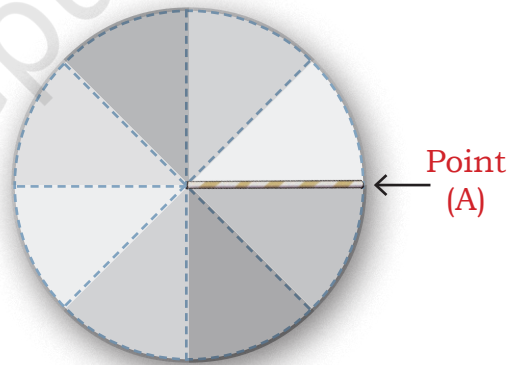
Attach a straw to the centre and mark the starting point as shown.

- (b) Now, try this.

- Show a $\frac{1}{8}$ turn of the straw.
- Show a $\frac{2}{8}$ turn. Show a $\frac{1}{4}$ turn. Show a $\frac{3}{8}$ turn.
- What angle have you made with a $\frac{2}{8}$ turn? A $\frac{1}{8}$ turn is half of a quarter turn.
- What angle have you made with a $\frac{4}{8}$ turn?

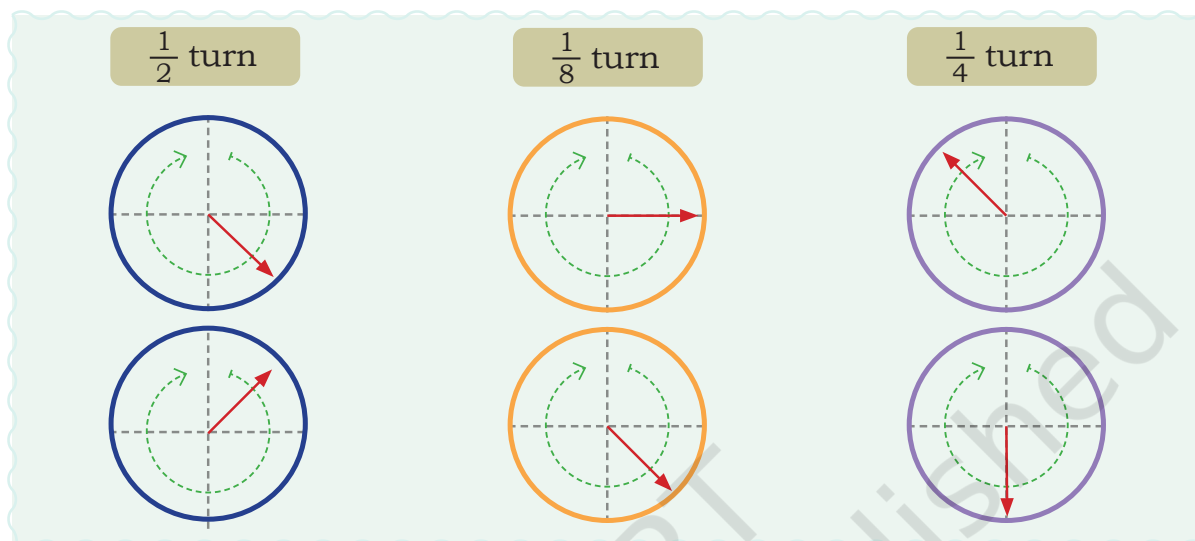
Continue turning by $\frac{5}{8}$, $\frac{6}{8}$, $\frac{7}{8}$, and $\frac{8}{8}$. Check when you have completed a $\frac{3}{4}$ turn and a full turn.

Now, cut out $\frac{1}{8}$ part and $\frac{2}{8}$ parts of the circle and paste them on a thicker paper or board. Use these as angle measuring tools.



Let Us Think

- In the following circles, the end points of $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{8}$ turns are shown. Draw arrows to show the starting points.



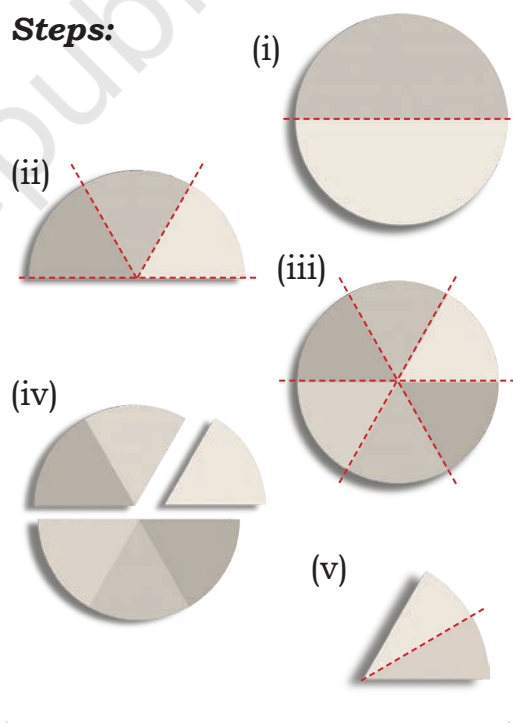
Now, cut out a circle from a tracing paper. First, fold the circle in half, and then fold it again into 3 equal parts. Attach a straw at the centre of the circle. Mark the starting point and show the turns equal to $\frac{1}{6}$, $\frac{2}{6}$, and so on until you complete a full circle.

Cut out $\frac{1}{6}$ part and $\frac{2}{6}$ part of the circle. Fold one of the $\frac{1}{6}$ parts into half.

Can you guess what turn of the straw will be equal to half of a $\frac{1}{6}$ turn? This is the same as a $\frac{1}{12}$ turn.

Paste these parts on a thicker paper or board and you can use them as angle measuring tools.

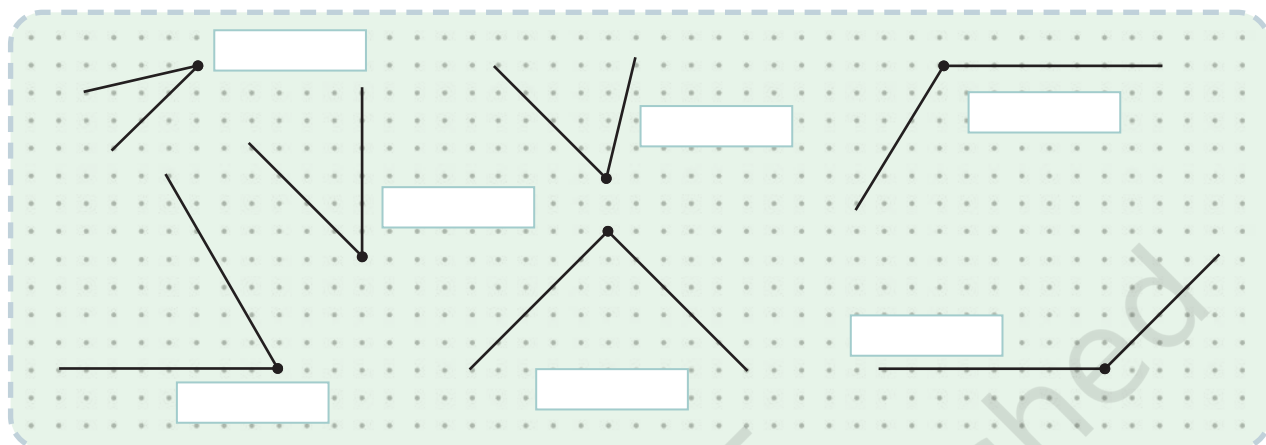
Steps:



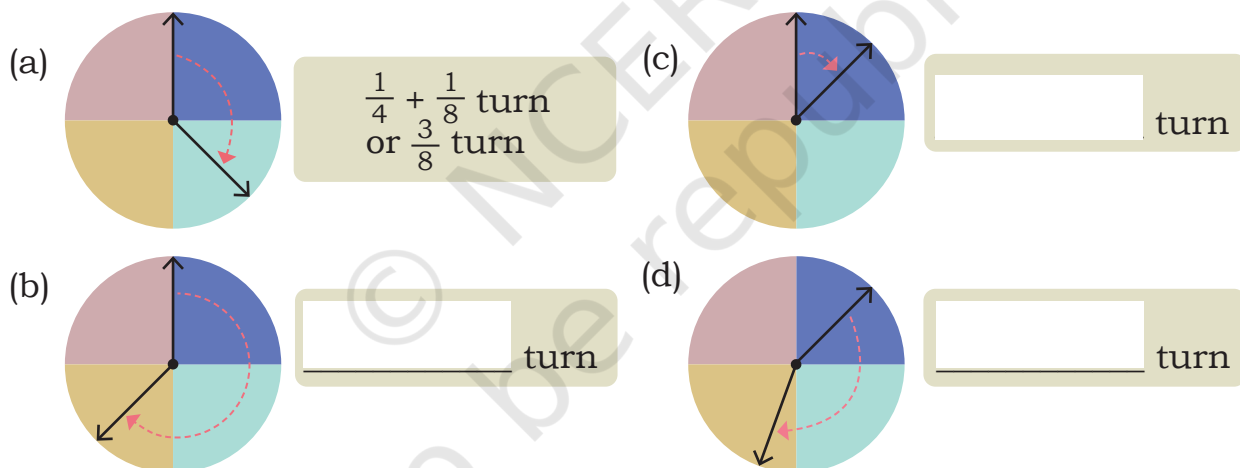
Note for Teachers: Help the learners to make the angle measuring tools using tracing paper. Use these for measuring various angles. Let them mark the starting point. Also, help them fix a straw at the centre and measure the turns with respect to the starting point.

Let Us Do

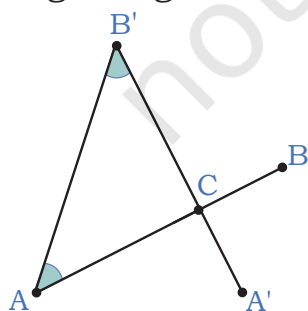
1. Guess the measures of each of the angles shown below. Then, check using your angle measuring tools. You may need to use a combination of measures. Also, state whether each of the angles is acute, right, or obtuse.



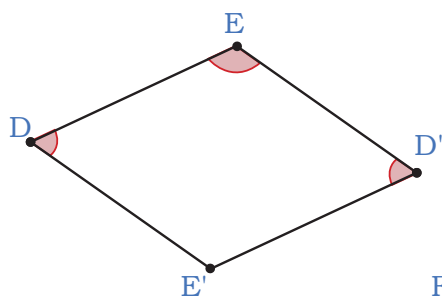
2. Guess the measure of the turns made by the arrow in each of the following cases. Verify with a combination of angle measuring tools.



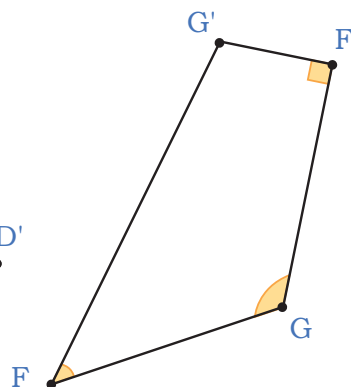
3. Measure each angle in the given shapes. Write the measure of the angles in terms of turns and describe whether they are acute, obtuse or right angles.



(a)

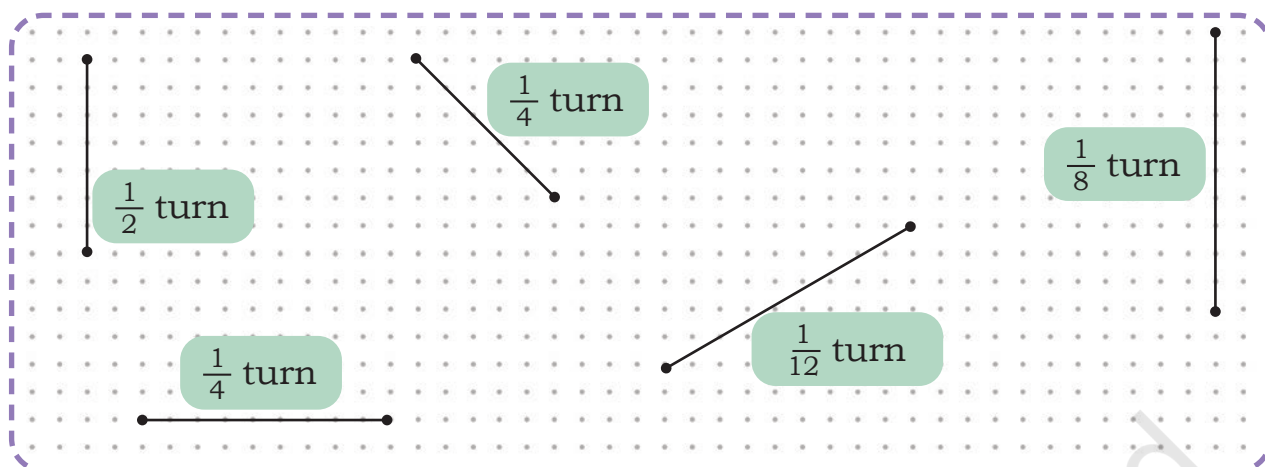


(b)



(c)

4. Draw angles for the given measures of turns using the given lines.

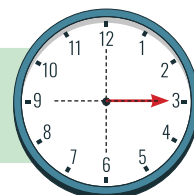


5. Draw the angles formed by the following turns in your notebook.

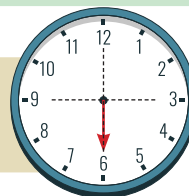
$\frac{1}{2}$ turn, $\frac{1}{4}$ turn, $\frac{2}{4}$ turn, $\frac{1}{6}$ turn, $\frac{4}{6}$ turn, $\frac{3}{12}$ turn, $\frac{1}{2} + \frac{1}{4}$ turn, and $\frac{1}{8} + \frac{1}{6}$ turn.

6. Guess the measure of turns the minute hand of a clock makes in each of the following cases. The initial position of the minute hand is given. Draw the final position of the minute hand on the clock face. Discuss your reasoning in class.

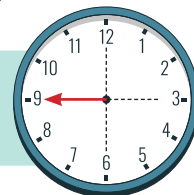
- (a) When the minute hand moves by 15 minutes, it has made a _____ turn of the circle.



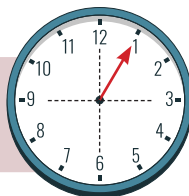
- (b) When the minute hand moves by 30 minutes, it has made a _____ turn of the circle.



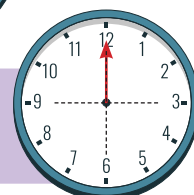
- (c) When the minute hand moves by 45 minutes, it has made a _____ turn of the circle.



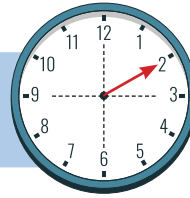
- (d) When the minute hand has turned by $\frac{1}{12}$ of a full turn, it has moved by _____ minutes.



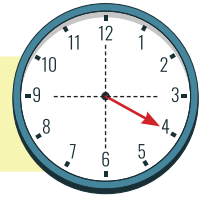
- (e) When the minute hand has turned a full-circle, it has moved by _____ minutes.



- (f) When the minute hand has turned by $\frac{1}{6}$ of a full turn, it has moved by ____ minutes.



- (g) When the minute hand has turned by $\frac{4}{12}$ of a full turn, it has moved by ____ minutes.



Which direction?

In which direction do the hands of a clock move?

The direction in which the hands of the clock move is called clockwise movement. The opposite movement is called anti-clockwise movement.

The creatures below have made a quarter turn once. Tick the direction in which they have moved.

<p>(Clockwise/Anti-clockwise)</p>	<p>(Clockwise/Anti-clockwise)</p>
<p>(Clockwise/Anti-clockwise)</p>	<p>(Clockwise/Anti-clockwise)</p>

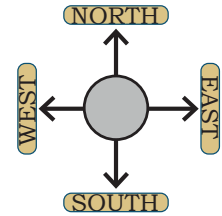
Try these

Observe the direction of movement while opening a tap, unscrewing a lid or loosening a nut. Do they move clockwise or anti-clockwise?

Fun with Turns

- The children in a class are playing a game in which the teacher tells them the direction in which they should rotate. Complete the table by filling the direction the children will face on completing the given turns.

The starting direction is given in the table.



Starting Direction	Turns	Ending Direction
North	Two right angles, clockwise	
South	Two right angles, anti-clockwise	
East	Four right angles, anti-clockwise	
West	Four right angles, clockwise	
North	5 right angles, clockwise	
South	3 right angles clockwise, $\frac{1}{2}$ right angle clockwise, $\frac{1}{2}$ right angle clockwise	
West	right angles clockwise, four $\frac{1}{2}$ right angles anti-clockwise	

2. Padma is facing the toy shop. What place will she face if she takes a half turn clockwise?



What other way can she turn to face the same place?