



$5(x - y)$

$\sqrt{64}$



$1\frac{7}{10}$

$(-1)^7$



## 24

# Location of a Place

By studying this lesson you will be able to,

- express the direction of a place with respect to a particular point, based on the direction of north or the direction of south,
- sketch the location of a place with respect to a particular point, based on the direction in which it is located and the distance from the point.

## 24.1 Introduction

In Grades 6 and 7 you learnt that, when a compass is placed on a flat surface the needle points in the direction of the North. The remaining main directions, South, East and West and the sub directions Northeast, Southeast, Southwest, and Northwest too can be located using a compass.

If a well and a coconut tree are situated due north of our house, one way of finding out their exact locations is to find the direct distance to the well from the house and the direct distance to the coconut tree from the house.

For example, if the distances from the house to the well and to the coconut tree are 105 m and 173 m respectively, then the location of the well is 105 m to the north of the house, and the location of the coconut tree is 173 m to the north of the house. We can find the exact location of the well and the coconut tree in this way.

The location of a place with respect to a particular point can be described exactly by specifying the direction in which it is located with respect to the point and the distance from the point to it.

Do the review exercise to revise what you have learnt in lower grades.





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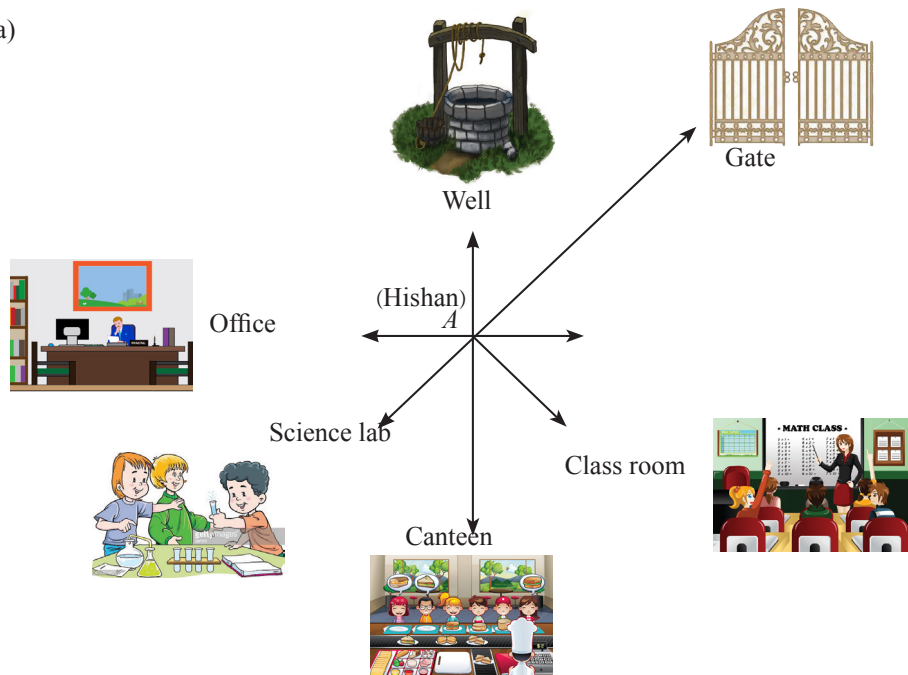
$\frac{7}{10}$

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**Review Exercise**

(1) (a)



Hishan observed a few places in the school from the point  $A$  located in the school grounds. The above figure is a sketch drawn with the information he gathered. Complete the given table using the sketch.

Place that was observed	Direction in which it is located with respect to $A$
(i)	
(ii)	
(iii)	
(iv)	
(v)	
(vi)	

(b) Complete each sentence using the above sketch.

- (i) Hishan is ..... of the well.
- (ii) Hishan is ..... of the office.
- (iii) Hishan is ..... of the classroom.
- (iv) Hishan is ..... of the canteen.
- (v) The science lab is situated ..... of the gate.
- (vi) The canteen is situated ..... of Hishan.



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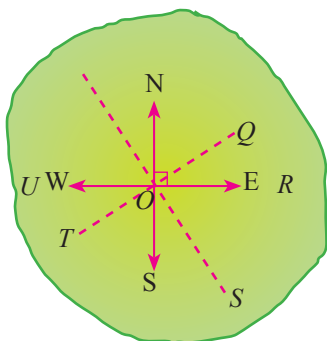


$1\frac{7}{10}$

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- (2) (a) A flat land is shown in the figure. Write the direction of each place given in the table with respect to the point  $O$ , using the main directions and sub directions.

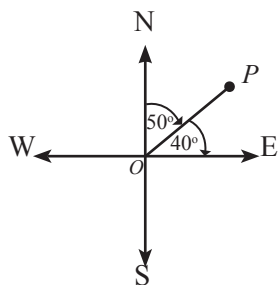


Place	Direction of the place with respect to $O$
$Q$	
$R$	
$S$	
$T$	
$U$	

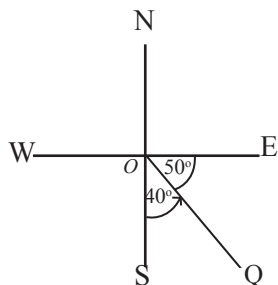
## 24.2 More on finding the direction of a place with respect to another place, based on the main directions

Let us now consider how we can express the direction of a place which is not in one of the main directions or sub directions from a particular position.

We know that the angle between any two adjacent main directions is a right angle. We describe the direction of a place which is not in either a main direction or a sub direction from a particular point, by means of an angle of less than  $90^\circ$  measured from a main direction



The direction of  $P$  as seen from  $O$  is  $50^\circ$  east of north. This is written as N  $50^\circ$  E.



The direction of  $Q$  as seen from  $O$  is  $40^\circ$  east of south. This is written as S  $40^\circ$  E.



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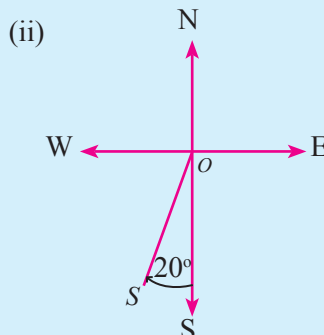
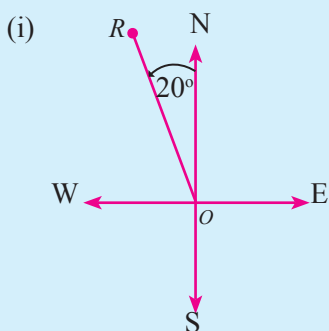
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### Example 1

Write down the direction of (i) the place  $R$  (ii) the place  $S$ , from the place  $O$ .



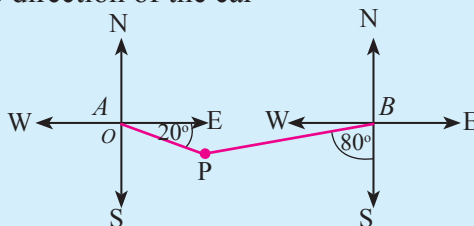
$R$  is located  $20^\circ$  west of north from  $O$ .  
The direction of  $R$  from  $O$  is N  $20^\circ$  W.

$S$  is located  $20^\circ$  west of south from  $O$ .  
The direction of  $S$  from  $O$  is S  $20^\circ$  W.

### Example 2

The figure shows the direction of  $P$  where a car is parked, as seen from the points  $A$  and  $B$  in a field. Write down the direction of the car

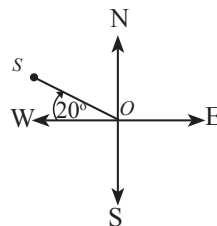
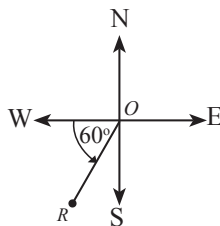
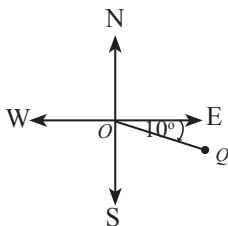
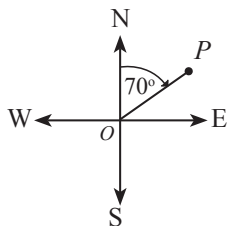
- (i) as seen from  $A$ ,  
(ii) as seen from  $B$ ,  
using the main directions.



- (i) The direction of the car is  $70^\circ$  east of south as seen from  $A$ . This is written as S  $70^\circ$  E.  
(ii) The direction of the car is  $80^\circ$  west of south as seen from  $B$ . This is written as S  $80^\circ$  W.

### Exercise 24.1

- (1) Write the direction in which each of the points  $P$ ,  $Q$ ,  $R$  and  $S$  in each of the following figures is situated with respect to the point  $O$ , based on either the direction of north or the direction of south.





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(2) Draw sketches to show each of the directions given below.

(i) N  $30^\circ$  W

(ii) S  $55^\circ$  W

(iii) S  $30^\circ$  W

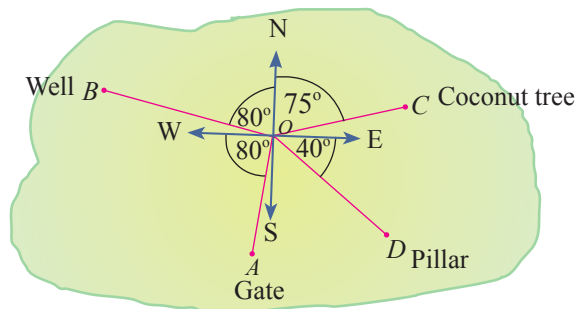
(iv) N  $30^\circ$  E

(v) Northeast (NE)

(vi) Northwest (NW)

(3) The camp  $P$  is situated due west of the camp  $Q$ . A fire in a forest is seen by a soldier in camp  $P$  in the direction  $75^\circ$  east of south. At the same instant, another soldier in camp  $Q$  sees the fire in the direction  $20^\circ$  west of south. Illustrate this information with a sketch.

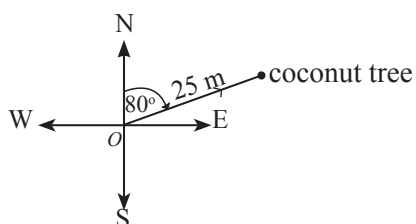
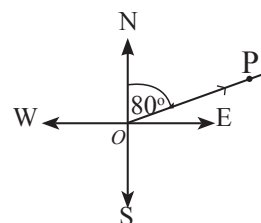
(4) The information on four places observed by a child from a point  $O$  in an open area is given in the figure. Complete the given table using this information.



The place which is observed	Direction with respect to $O$
$A$ - Gate	
$B$ - Well	
$C$ - Coconut tree	
$D$ - Pillar	

### 24.3 Illustrating the location of a place with respect to another place with a sketch

If the direct distance from  $O$  to  $P$  is known, where  $P$  is  $80^\circ$  east of north (N  $80^\circ$  E), then the exact location of  $P$  can be identified.



This sketch shows the location of a coconut tree 25 m from  $O$  in the direction  $80^\circ$  east of north (N  $80^\circ$  E).

The location of a place with respect to another place can be illustrated with a sketch as shown above.



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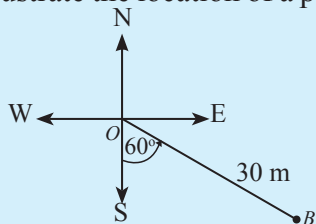
$\frac{7}{10}$

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**Example 1**

Illustrate the location of a place 30 m from  $O$  in the direction  $S 60^\circ E$  with a sketch.



**Exercise 24.3**

(1) Using the sketches given below, complete the given table.

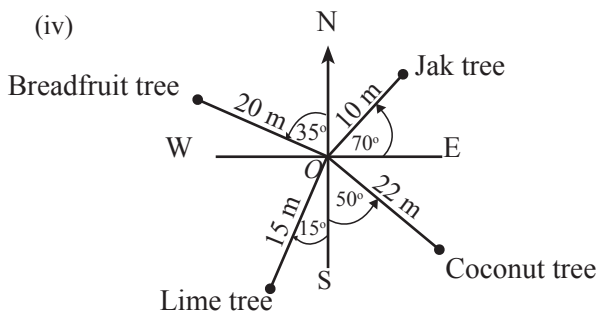
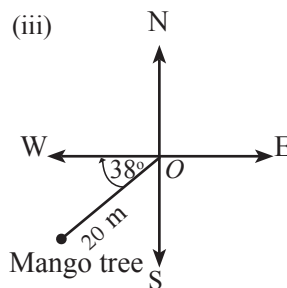
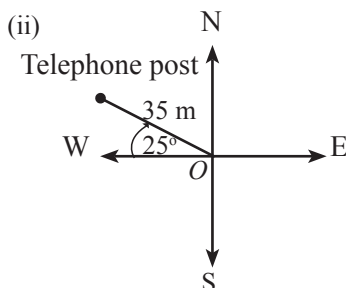
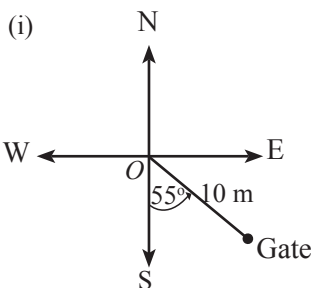


Figure	The place observed from $O$	Direction with respect to $O$	Distance from $O$
(i)	Gate	$S 55^\circ E$	10 m
(ii)	.....	.....	.....
(iii)	.....	.....	.....
(iv)	Jak tree	.....	.....
	Coconut tree	.....	.....
	Lime tree	.....	.....
	Breadfruit tree	.....	.....



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- (2) Draw sketches using the information given below.
- $B$  is situated 50 m from  $A$  in the direction S  $10^\circ$  W.
  - $Q$  is located 25 m from  $P$  in the direction N  $70^\circ$  W.
  - A child standing at the point  $K$  in a playing field sees the gate which is 50 m away in the direction S  $20^\circ$  W.
  - Tharushi standing at a point  $P$  on flat ground sees Radha 20 m away in the direction S  $50^\circ$  E and Fathima 15 m away in the direction S  $25^\circ$  W.
- (3) Kavindu travelled 20 m from  $O$  in the direction N  $44^\circ$  E, and from that point he travelled 20 m in the direction S  $45^\circ$  E to reach his destination.
- Draw a sketch based on the above information.
  - In which direction is Kavindu now with respect to  $O$ ?

### Miscellaneous Exercise

- (1) For each of the following, draw a sketch based on the given information.
- A person at  $P$  walked to a place  $Q$  located 100 m away in the direction N  $35^\circ$  E. From there he walked to his work place  $R$ , located 75 m away in the direction S  $20^\circ$  E.
  - The school that Kavindu attends is situated 125 m away from his home, in the direction S  $30^\circ$  E.
  - Bhashitha standing at the location  $B$  in a field, can see his school in the direction N  $35^\circ$  W. Thushara who is standing 100 m away to the east of Bhashitha sees the school in the direction N  $40^\circ$  W.

### Summary

-  The location of a place which lies along a main direction from a particular point can be expressed in terms of its direction and its distance from that point.
-  The direction of a place with respect to a particular point can be described based on the direction of north and the direction of south.
-  The location of a place with respect to a particular point can be illustrated in a sketch based on the direction and distance to that place from the point.