



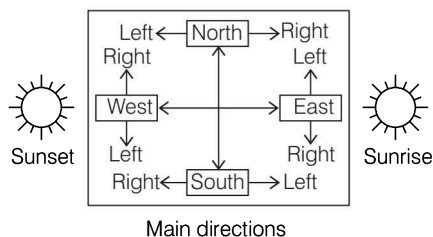
# Direction Sense Test

Direction is the general position of one thing with respect to another thing and displacement is the distance between the starting point and final point.

In this chapter, we deal with the questions in which a successive follow-up of directions is given and the candidate is required to determine the final direction or the distance between two points.

## Main Directions

There are four main directions viz. East, West, North and South as shown in the figure given below

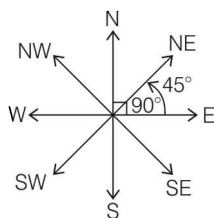


Abbreviations for these directions are E (East), W (West), N (North) and S (South).

## Cardinal Directions

A direction between two adjacent main directions is called cardinal direction or subdirection, i.e. NE (North-East), NW (North-West), SE (South-East) and SW (South-West).

Students are advised to use adjacent diagram for the purpose of sensing directions.

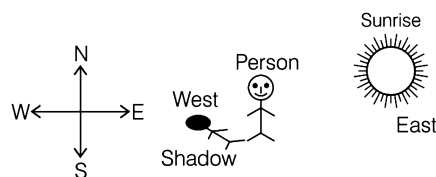


Angle formed between two main directions is  $90^\circ$  and angle formed between a cardinal direction and main direction is  $45^\circ$ .

## Concept of Shadow

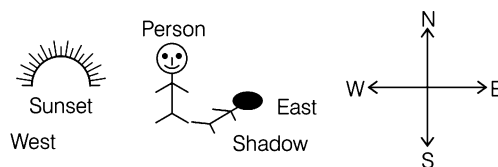
### Shadow at the Time of Sunrise

In the morning, Sun rises in the East and the shadow of any person or object falls in the West.



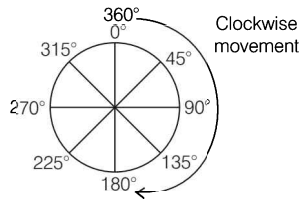
### Shadow at the Time of Sunset

In the evening the Sun sets in the West and the shadow of a person or an object falls in the East.

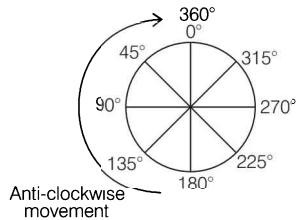


## Angle of Movement

- (i) Movement in the direction of clock is called the clockwise (CW) movement.



- (ii) Movement opposite to the direction of clock is called anti-clockwise (ACW) movement.

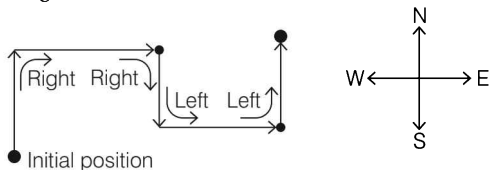


### Example 1 Vandana is going Northwards.

She turns right, moves some distance and again turns to her right. After moving some distance, she turns to her left, goes forward and again turns to her left. In which direction now is Vandana going?

- (a) North (b) South-West  
(c) South (d) West

**Sol.** (a) According to the question, the direction diagram can be drawn as

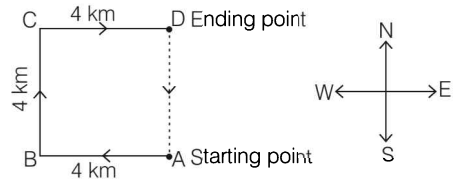


Clearly, Vandana is going towards North.

### Example 2 After starting from a point, a man walks 4 km towards West, then turning to his right he moves 4 km. After this, he again turns right and moves 4 km. Which choice given below indicates the correct direction in which he is from his starting point?

- (a) North (b) East  
(c) South (d) West

**Sol.** (a) The direction diagram of a man is as given below

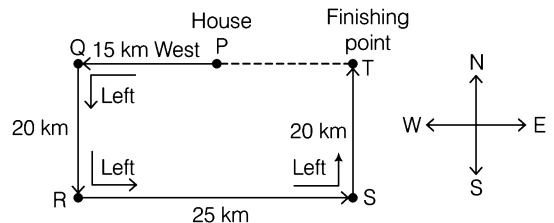


Let A be the starting and D be the ending point of man. It is clear from the diagram that, he is in North direction from his starting point.

### Example 3 Laxman went 15 km to the West from house, then turned left and walked 20 km. He, then turned East and walked 25 km and finally turning left covered 20 km. How far is he now from his house?

- (a) 15 km (b) 20 km  
(c) 25 km (d) 10 km

**Sol.** (d) According to the question, the direction diagram will be as follows



$$PQ = 15 \text{ km}$$

$$QR = TS = 20 \text{ km}$$

$$RS = 25 \text{ km}$$

∴ Required distance,

$$PT = QT - QP = RS - QP \quad [\because RS = QT]$$

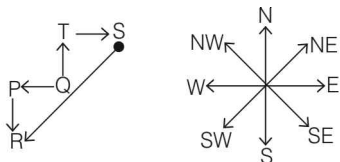
$$= 25 - 15 = 10 \text{ km}$$

### Example 4 Five villages P, Q, R, S and T

situated close to each other. P is to the West of Q, R is to the South of P, T is to the North of Q and S is to the East of T. Then, in which direction is R with respect to S?

- (a) North-West  
(b) South-East  
(c) South-West  
(d) Data inadequate

**Sol.** (c) According to the given information, locations of the five villages can be represented as

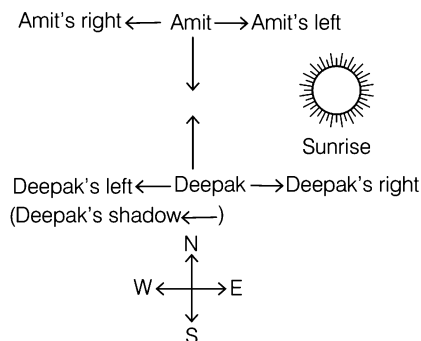


Clearly, R lies to the South-West of S.

**Example 5** At sunrise, Amit and Deepak are having a conversation standing in front of each other. The shadow of Deepak is formed towards the right hand of Amit. What direction is Deepak facing?

- (a) North-East (b) South  
(c) East (d) North

**Sol.** (d) According to the question, the direction diagram is drawn as

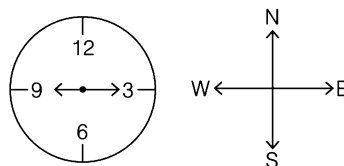


Clearly, Deepak is facing North.

**Example 6** The time on the watch is 9 : 15 and the hour hand points towards West. The direction of the minute hand is

- (a) North (b) South (c) East (d) West

**Sol.** (c) According to the question, the direction diagram will be as follows

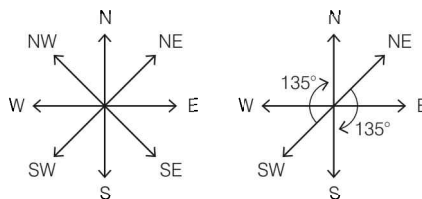


So, when hour hand is pointing towards West, then the minute hand will be pointing towards East at 9 : 15.

**Example 7** If South-West becomes North, then what will North-East be?

- (a) North (b) South-East  
(c) South (d) East

**Sol.** (c) The diagrammatic representation of direction is as shown below



Clearly, directions are moving  $135^\circ$  clockwise. Hence, North-East will become South on moving  $135^\circ$  clockwise.

## Practice Exercise

- After starting from a point, A walks 3 km towards East, then turning to his left he moves 3 km. After this, he again turns left and moves 3 km. In which direction is A from his starting point?  
(a) North (b) East (c) West (d) South
- A policeman left his police post and proceeded 4 km South on hearing a loud sound from point A. On reaching the place, he heard another sound and proceeded 4 km to his left to the point B.

From B, he proceeded left to reach another place C, 4 km away. In which direction, he has to go to reach his police post?

- (a) North (b) South  
(c) East (d) West

- A man walks 6 km South, turns left and walks 4 km, again turns left and walks 5 km. Which direction is he facing now?  
(a) South (b) North  
(c) East (d) West

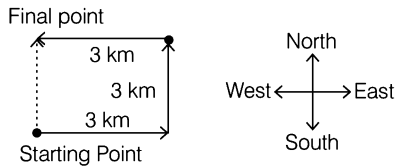
4. A boy running towards South, turns to his right and runs. Then, he turns to his right and finally to his left. Towards which direction is he running now?  
(a) East (b) West (c) South (d) North
5. Pratap starts from school and walks 7 km towards East. He takes a left and walks 4 km, then takes a right and walks 2 km, again takes a right and walks 3 km. Which direction is he facing now?  
(a) South (b) North (c) East (d) West
6. Ram cycled 10 km Southward from his home, turned right and cycled 6 km, turned right cycled 10 km, turned left and cycled 15 km. How many kilometres will he have to cycled straight to reach home?  
(a) 10 km (b) 21 km  
(c) 16 km (d) 20 km
7. Rakesh leaves from his house. He walks 10 m in North-West direction and then 20 m in South-West direction. Next, he moves 20 m in South-East direction. Finally, he turns towards his house. In which direction is Rakesh going?  
(a) South-East (b) North-West  
(c) South-West (d) North-East
8. Shreya started from point P and walked 2 m towards West. She, then took a right turn and walked 3 m before taking a left turn and walking 5 m. She finally took a left turn, walked 3 m and stopped at a point Q. How far is point Q from point P?  
(a) 2 m (b) 6 m (c) 7 m (d) 8 m
9. Ankit started walking towards North. After walking 30 m, he turned towards left and walked 40 m. He, then turned left and walked 30 m. He again turned left and walked 50 m. How far is he from his original position?  
(a) 50 m (b) 40 m  
(c) 30 m (d) None of these
10. Starting from the point, Raju walked 12 m North, he turned right and walked 10 m, he again turned right and walked 12 m, then he turned left and walked 5 m. How far is he now and in which direction from the starting point?  
(a) 27 m towards East (b) 5 m towards East  
(c) 15 m towards East (d) None of these
11. City D is to the West of city M. City R is to the South of city D. If city K is to the East of city R, then in which direction is city K located in respect of city D?  
(a) North (b) East  
(c) North-East (d) South-East
12. One evening before sunset, two friends Raman and Arjun were talking to each other face to face. If Raman's shadow was exactly to his left side, which direction was Arjun facing?  
(a) West (b) East  
(c) North (d) South
13. A direction pole was situated on the road crossing. Due to an accident, the pole turned in such a manner that the pointer which was showing East, started showing South. Sita, a traveller went to the wrong direction thinking it to be West. In which direction actually she was travelling?  
(a) North (b) West  
(c) East (d) South
14. The time in a clock is quarter past twelve. If the hour hand points to the East, then what is the direction opposite to the minute hand?  
(a) South-West (b) South  
(c) West (d) North
15. A girl is facing North. She turns  $180^\circ$  in the anti-clockwise direction and then  $225^\circ$  in the clockwise direction. Which direction is she facing now?  
(a) West (b) North-East  
(c) South-West (d) East
16. It is 6 O'clock in a watch and it is rotated by  $45^\circ$  degree in a manner such that if the minute hand points towards the North-East, then hour hand will point towards which direction?  
(a) South (b) South-West  
(c) South-East (d) North-West

# Answers

1	(a)	2	(d)	3	(b)	4	(b)	5	(a)	6	(b)	7	(d)	8	(c)	9	(d)	10	(c)
11	(d)	12	(c)	13	(a)	14	(d)	15	(b)	16	(b)								

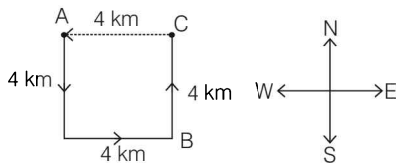
## Hints & Solutions

1. According to the question,



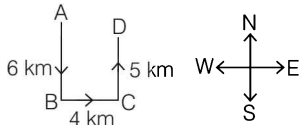
Thus, A is in North direction from his starting point.

2. The movement of policeman is shown in the figure given below



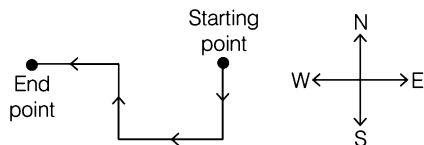
For reaching A (starting point) from C, policeman will have to move in the West direction.

3. According to the question,



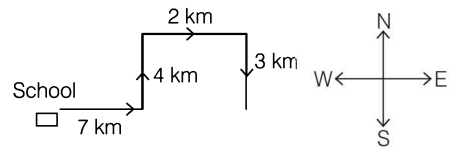
Let the man starts from the Point A and passing through B and C, he reaches D. Clearly, he is now facing North.

4. The direction diagram is as follows



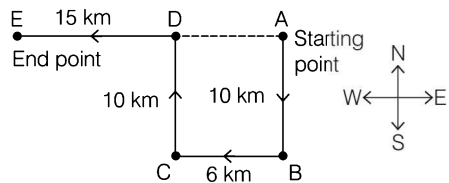
Finally, he is running in West direction.

5. The direction diagram of Pratap is as follows



It is clear from the diagram that, he is facing South direction.

6. According to the question,



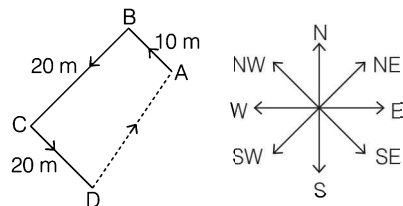
Now, to go back home, Ram has to cycle

$$= (ED + DA) = (15 + 6)$$

$$= 21 \text{ km}$$

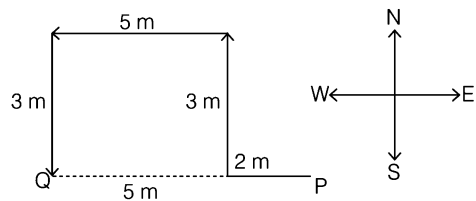
$$[\because AD = CB]$$

7. According to the question,

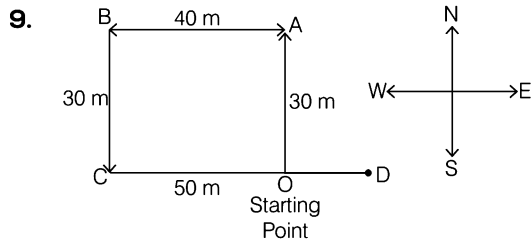


It is clear from the diagram that, Rakesh is going in North-East direction.

- 8.

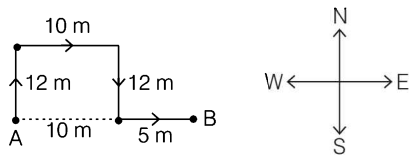


$$\therefore \text{Required distance} = 5 + 2 = 7 \text{ m}$$



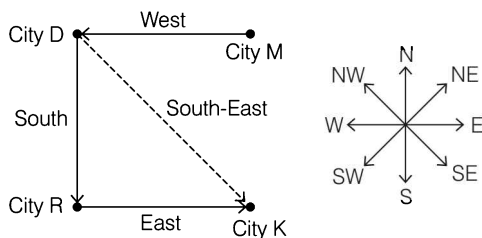
∴ Required distance =  $50 - 40 = 10$  m

10. According to the question,



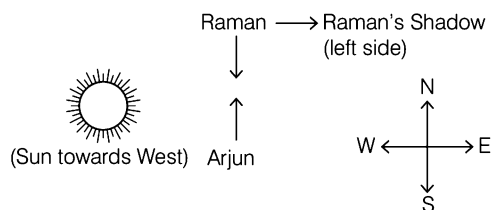
Finishing Point B is at a distance of 15 m from starting Point A and in the East direction.

11. According to the question, the direction diagram is as follows



Hence, city K is located in the South-East direction with respect to city D.

12. According to the question,



So, Arjun was facing North.

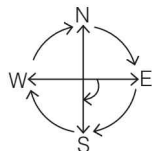
13. The pointer which was showing East started showing South.

After accident,

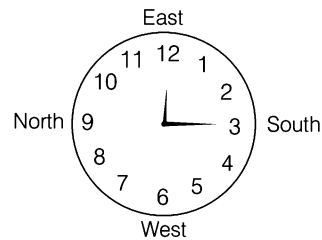
E → S  
S → W  
W → N  
N → E

∴ Pointer turned  $90^\circ$  clockwise.

So, Sita actually went in North direction.

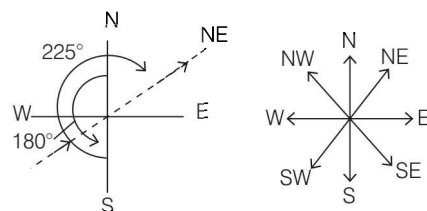


14. Given information can be represented as,



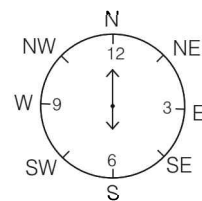
The clock is showing 12:15 and according to the question, the direction of hour hand is in East. So, the minute hand points towards South direction. The direction opposite to South is North. Hence, the direction opposite to minute hand is North.

15. According to the question,

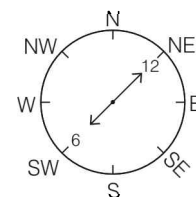


Hence, she is facing North-East direction.

16. Initial position,



After rotating,



Clearly, after rotation the hour hand will point towards South-West direction.



## Try Yourself

- 1) A man goes 5 km East, then he turns right and goes 4 km, then he turns left and goes 5 km. Which direction is he facing now?  
(a) North (b) South  
(c) East (d) West
- 2) A man walks 6 km South, turns left and walks 4 km, again turns left and walks 5 km. Which direction is he facing now?  
(a) South (b) North (c) East (d) West
- 3) From his house, Deepak went 25 km to North. Then, he turned West and covered 15 km. Then, turned South and covered 10 km. Finally, turning to East, he covered 15 km. In which direction is he from his house?  
(a) North (b) South  
(c) West (d) East
- 4) Shreya started from point P and walked 2 m towards West. She, then took a right turn and walked 3 m before taking a left turn and walking 5 m. She finally took a left turn, walked 3 m and stopped at a point Q. How far is point Q from point P?  
(a) 2 m (b) 6 m (c) 7 m (d) 8 m
- 5) Mohan walked 30 m towards South, took a left turn and walked 15 m. He, then took a right turn and walked 20 m. He again took a right turn and walked 15 m. How far is he from the starting point?  
(a) 95 m  
(b) 50 m  
(c) 70 m  
(d) Cannot be determined
- 6) City C is to the South of city B and city A is to the North of city C. In which direction is city A located in respect of city B?  
(a) North  
(b) South  
(c) East  
(d) Cannot be determined
- 7) If South-West becomes North, then what will North be?  
(a) North (b) South-East  
(c) South (d) East
- 8) One morning after sunrise, Suraj was standing facing a pole. The shadow of the pole fell exactly to his right. Which direction was Suraj facing?  
(a) West (b) South  
(c) East (d) Data inadequate
- 9) If the digit 12 of a clock is pointing towards East, then in which direction will digit 9 point?  
(a) South (b) West  
(c) North (d) North-East
- 10) A man is facing West. He turns  $45^\circ$  in the clockwise direction and then another  $180^\circ$  in the same direction and then  $270^\circ$  in the anti-clockwise direction. Which direction is he facing now?  
(a) South (b) North-West  
(c) West (d) South-West

### Answers

- |       |       |       |       |        |
|-------|-------|-------|-------|--------|
| 1 (c) | 2 (b) | 3 (a) | 4 (c) | 5 (b)  |
| 6 (d) | 7 (b) | 8 (b) | 9 (c) | 10 (d) |