

DIRECTION TEST

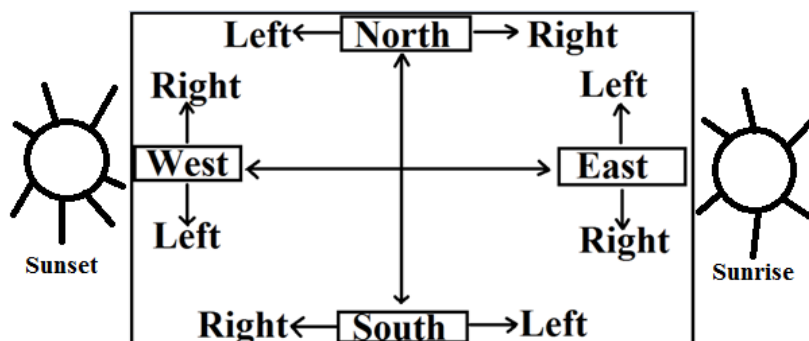
Direction is a measurement of position of one thing with respect to another thing.

Displacement is the measurement of distance between initial and the final point.

Here the candidate's ability to trace and follow the logical path correctly and sense of direction correctly as well. Direction and distance test mainly deals with two types of direction i.e., main direction and cardinal direction

Main Direction

There are four type of directions, viz. East West North and South. Sun rises in the East. Just opposite of East is West and South is in the opposite to North.



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

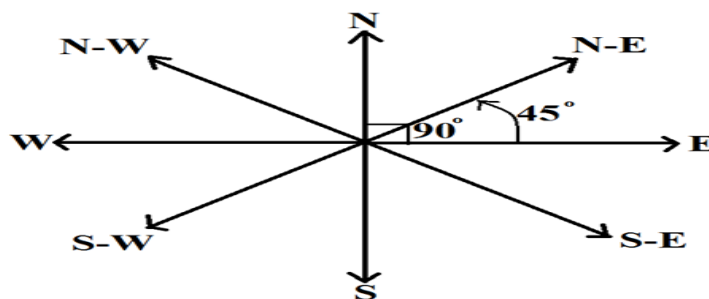
Cardinal Directions

A direction between two main directions is called cardinal direction. Clearly, there are four cardinal directions.

They are

- N-E (North-East)
- N-W (North-West)
- S-E (South-East) and
- S-W (South-West)

We should use the diagram as given in question for the purpose of sensing directions.

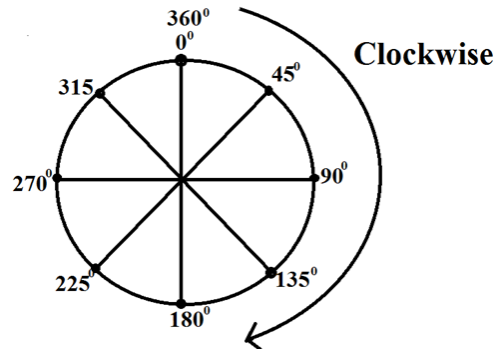


Note:- Angle formed between two main directions is 90° and angle formed between a cardinal direction and main direction is 45°

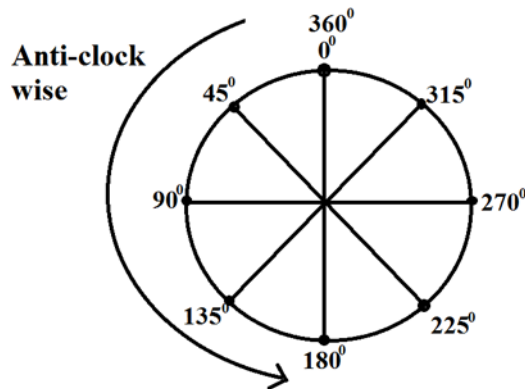
Rotation of Angles

To solve angle movement questions. It is necessary to know about the rotations of angles which are given below

i) For right direction movement (Clockwise)



ii) For left direction movement (Anti-clockwise)



Left turn Anti-clockwise direction

Right turn Clockwise direction

The Change in Direction when a Person or Vehicle Takes A Right or a Left Turn

Direction before taking the turn	Direction in which the person or vehicle will be moving after taking the turn	
	Right	Left
North	East	West
South	West	East
East	South	North
West	North	South

The distance from a point is 'P' in horizontal direction and a distance of 'Q' in vertical direction is equal to $\sqrt{P^2 + Q^2}$.

.Pythagoras Theorem

I. $QR^2 = QP^2 + PR^2$ or $QR = \sqrt{QP^2 + PR^2}$

II. $QP^2 = QR^2 - PR^2$ or $QP = \sqrt{QR^2 - PR^2}$

III. $PR^2 = QR^2 - QP^2$ or $PR = \sqrt{QR^2 - QP^2}$

Shadow Case

In morning/ Sunrise time

- a) If a person facing towards Sun, the shadow will be towards his back or in west.
- b) If a person facing towards South, the shadow will be towards his right.
- c) If a person facing towards West, the shadow will be towards his front.
- d) If a person facing towards North, the shadow will be towards his left.

In evening/ Sunset time

- a) If a person facing towards Sun, the shadow will be towards his back or in East.
- b) If a person facing towards North, the shadow will be towards his right.
- c) If a person facing towards East, the shadow will be towards his front.
- d) If a person facing towards South, the shadow will be towards his left.

Note- At 12:00 noon is no shadow because the rays of the Sun are vertically downward.

Question covered under the head of 'direction test' further divided into following types

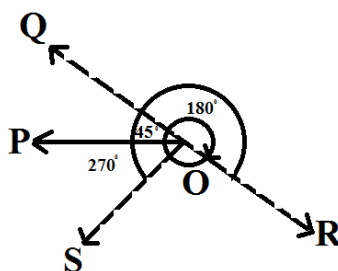
Type 1. Final Direction Based

In this type of questions, we have to ascertain the final direction with respected to the initial point or the directional relations between two points/things.

Example 1. A man is facing towards West and turns through 45° clockwise, again 180° clockwise and then turns through 270° anti-clockwise. In which direction is he facing now?

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

Ans. e)



Finally on moving 270° anti-clockwise, he faces in the direction OS which is South-West.

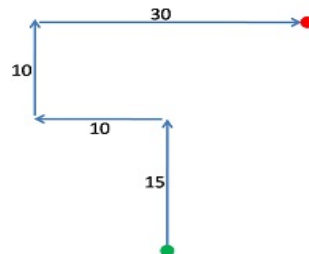
2) Joe is walking towards North for 15 miles, turns left and walks another 10 miles. He then turns right and walks 10 miles. Now, he again turns right and walks 30 miles. Which direction is he from Starting point?

- a) South-East
- b) North-East

- c) North-West
- d) South-West
- e) None of these

Answer: b) North-East

Diagram:

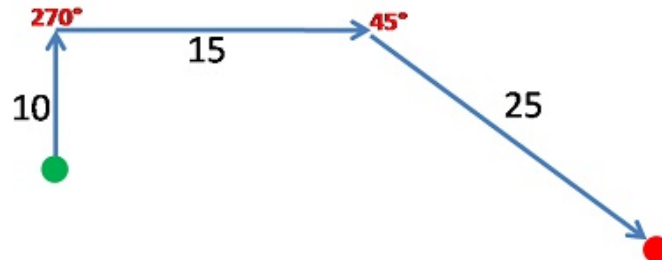


3) Morris is facing North and walks 10kms. He turns 270° anti-clockwise and walks 15kms. Now, he again turns 45° clockwise and walks for 25kms. Which direction is he facing now?

- a) North-West
- b) South-West
- c) North-East
- d) South-East
- e) None of these

Answer: d) South-East

Diagram:

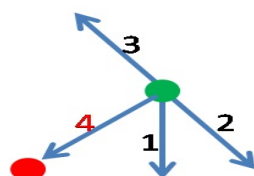


4) Joe is facing towards South and turns 45° anti-clockwise. He turns again 180° in anti-clockwise direction. Now, he turns 270° clockwise. Which direction is he facing?

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

Answer: c) South-West

Diagram:

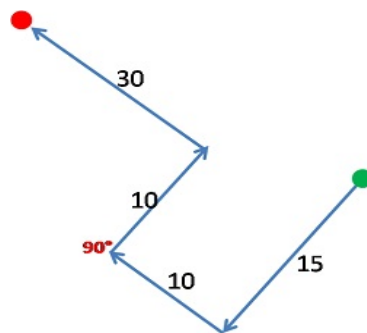


5) Mary is walking towards South-West for 15 miles, turns right and walks another 10 miles. She then turns 90° Clockwise and walks 10 miles. Now, she again turns left and walks 30 miles. Which direction is she facing?

- a) East
- b) West
- c) South-East
- d) North-West
- e) Can't determined

Answer: d) North-West

Diagram:



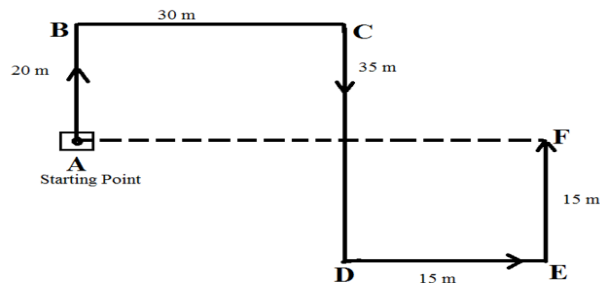
Type-2 Distance (Displacement) Based

In this type of question, we deal with the final distance between starting and final point or between two points/persons/things. There are various formats/patterns of displacement.

Example 1. Mayank walks 20 m North. Then, he turns right and walks 30 m. Now, he turns right and walks 35 m. Now, turning left, he walks 15 m. Again, he turns left and moves 15 m. Finally, turning left he again walks 15 m. In which direction and how far is he from his original position?

- a) 15 m, East
- b) 45 m, East
- c) 15 m, West
- d) 45 m, West
- e) None of these

Ans. b)



Mayank's distance from his original position (AF) = BC + DE = 30 + 15 = 45 m

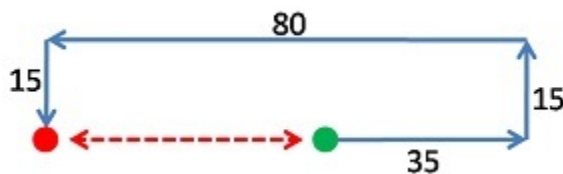
Also 'F' lies to East of 'A'.

2) Joe went 35 meters towards east from Mary's house. He turns left and walks 15 meters. Now, he takes a left turn and walks 80 meters. Finally, he turns left and walks for 15 meters. How far Joe is from Mary's house?

- a) 30
- b) 45
- c) 50
- d) 65

Answer: b) 45

Diagram:

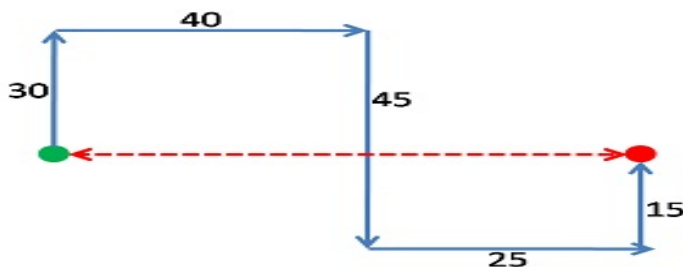


3) Maria walked 30 m towards north. She turned right and walked 40 m. She then turned right and walked 45 m. She turned left and walked 25 m. Finally she turned left and walked 15 m. How far is she from the starting position?

- a) 55
- b) 65
- c) 30
- d) 45

Answer: b) 65

Diagram:

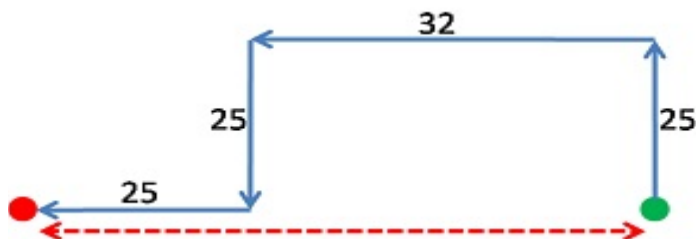


4) Harry walks 25 meters towards North from his friend's house. Then he turns left and walks 32 meters. He again turns left and walks 25 meters. Further, he moves 25 meters after turning to his right. How far is he from his friend's house?

- a) 50
- b) 7
- c) 57
- d) 0
- e) Can't determined

Answer: c) 57

Diagram:



5) A Boy walks 12kms towards east. He turns 90° clockwise and walks 20kms then he turned right and walked for 33kms. How far is he from starting point?

a) 65

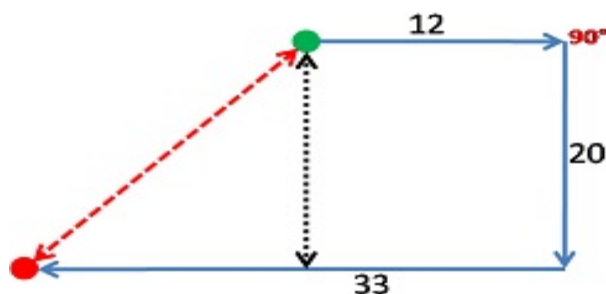
b) 29

c) 21

d) 43

Answer: b) 29

Diagram:



Type-3. Distance (Displacement) and Direction Based

In this type of questions, we deal with the final distance between starting and final point of any person/object/thing. There are various formats/patterns of distance and direction.

Example 1. A tourist drives 10 Km towards East and turns to the right hand and drives 3 Km. Then, he drives towards West (turning to his right) 3 Km. He, then turns to his left and drives 2 Km. Finally he turns to his right and travels 7 Km. How far is he from his starting point and in which direction would he be?

a) 10 Km, East

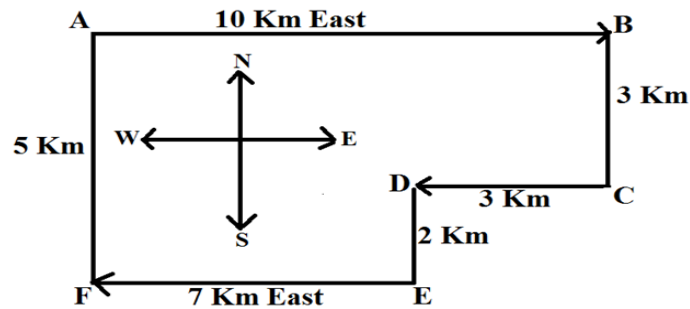
b) 9 Km, North

c) 8 Km, West

d) 5 Km, South

e) 3 Km, South

Ans. (d)



Required distance $AF = BC + DE = 3 + 2 = 5 \text{ Km}$

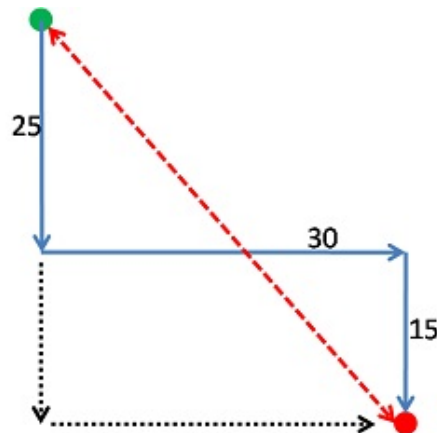
His final point is F which is in South direction from starting point A.

2) A car travels 25 kms towards south from garage. It turns left and travels 30 kms, then turns right and travels 15 kms. how far is car from the garage and in which direction?

- a) 40 North-East
- b) 70 South-East
- c) 60 North-East
- d) 50 South-East

Answer: d) 50 South-East

Diagram:

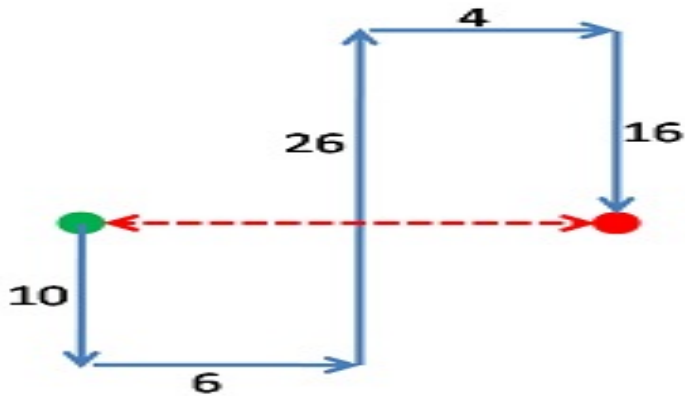


3) Jerry starts walking towards South from his house. After travelling 10 meters, he turns left and walks 6 meters. He turns left and walks 26 meters and then he turns right and walks 4 meters. Finally, he turns right and walks for 16 meters. How far is he from his house and in which direction?

- a) 10 East
- b) 20 West
- c) 16 East
- d) 26 West

Answer: a) 10 East

Diagram:

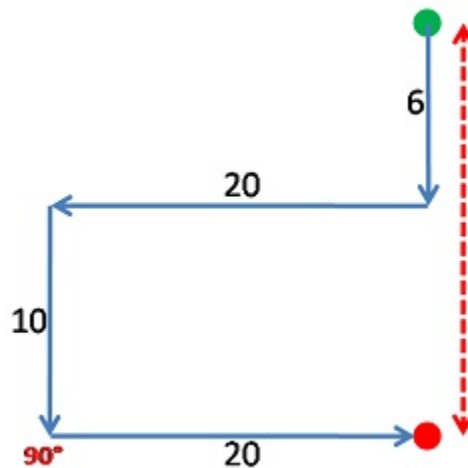


4) Joseph walks 20 meters from his house and after that he turns 90° clockwise and walks 10 kms. He turns right and walks for 20 kms, then he turns left and walks for 6 kms. Finally, he is going towards North. How far Joseph is from his house and in which direction?

- a) 40 South
- b) 20 South
- c) 16 North
- d) 15 North

Answer: c) 16 North

Diagram:

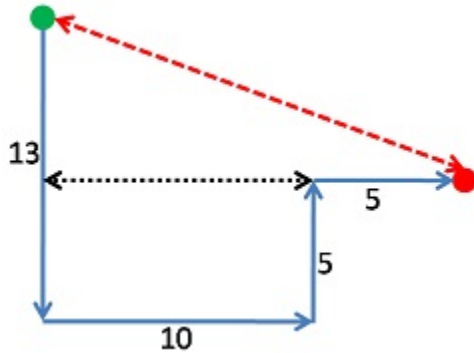


5) Martin walked 13 meters towards South from his Gym. He turned left and walked 10 meters. He took a left turn and walked 5 meters and then he turned right and walked for 5 meters. How far is he from his Gym and in which direction?

- a) 19 North-West
- b) 13 South-East
- c) 15 North-West
- d) 17 South-East

Answer: d) 17 South-East

Diagram:



Practice Questions

1. A direction pole was on the crossing. Due to an accident, the pole turned in such a manner, that the pointer which was showing East, started showing South. One traveler went to the wrong direction thinking it to be West. In what direction was he actually travelling?

- A. South
- B. East
- C. West
- D. North

2. Rahul walks 30 meters towards south then turns to his right and starts walking straight till he completes another 30 meters. Then again turning to his left he walks 20 meters. He then turns to his left and walks for 30 meters. How far is he from his initial position?

- A. 30 meters
- B. 50 meters
- C. 10 meters
- D. 60 meters

3. A person moves North, then turns to his right and then again right and then finally go to left. In which direction is he moving now?

- A. East
- B. South-East
- C. West
- D. North

4) One morning after sunrise, Joe was standing facing a pole. The shadow of the pole fell exactly to his right. To which direction was he facing?

- A) East
- B) South
- C) West
- D) Data is inadequate

5) James and Henry were standing facing each other at 8AM. Shadow of the Henry fell exactly to his right. To which direction was James facing?

- A) East
- B) South
- C) North
- D) Data is inadequate

6) Ted drives a car 10 miles towards North from his office. He turns 270° clockwise and drives for 20 miles. Now, he turns 270° anti-clockwise and drives a car for 37 miles. Finally, he reaches his house after driving for 20 miles to his right. How far is Ted's house from his Office and in which direction?

- A) 40 South
- B) 47 North
- C) 30 East
- D) 37 West

7) John starting from his house, goes 21 miles west, then he turns 90° clockwise and goes 20 miles. What minimum distance should be covered by him to come back to his house?

- A) 4 B) 21
C) 29 D) 59

8) Prince was standing facing to the Pole at 1:48PM. Shadow of the Pole fell towards his right. To which direction was Prince facing?

- A) West B) South
C) East D) North

Answers:

1.B	2.C	3.B	4.C	5.D	6.D	7.B	8.A
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Part 1 - Basic

Model 1: Tracing the Path

1. A vehicle starts from point P and runs 10 km towards North, It takes a right turn and runs 15 km. It now runs 6 km after taking a left turn. It finally takes a left turn, runs 15 km and stops at point Q?

i. How far is point Q with respect to point P?

- 1) 16 km 2) 25 km 3) 4 km 4) 20 km 5) None of these

ii. Towards which direction was the vehicle moving before it stopped at point Q?

- 1) North 2) East 3) South 4) West 5) North-West

iii. In which direction point Q with respect to P?

- 1) East 2) South 3) West 4) North-West 5) North

2. Vehicle started moving towards east. After moving a distance of 20 meters, it took a right turn, again after moving 10 meters, it took a left turn, and again after moving 10 meters, he took a left turn. Which direction is the vehicle moving now?

- 1) West 2) North-West 3) North 4) East 5) South

3. A car started from point P and moves towards South and stops at point Q. It now takes a right turn followed by a left turn and stops at point R. It finally takes a left turn and stops at point S. If it moves 5 km before taking each turn, towards which direction car has to move from S to reach point Q?

- 1) North 2) East 3) South 4) West 5) North-West

Model 2: Tracing the Path - Pythagoras Theorem

4. A person started moving towards west and stopped at point 'P' after covering 10 km. He then takes a right turn and stopped at point 'Q' after covering 12 km. Finally, he takes left turn, covers 6 km and stops at point R. What is the distance between the starting point and stopping point?

- 1) 20 km 2) 40 km 3) 60 km 4) 80 km 5) None of these

5. Gautam walked 35 meters towards south. Then he turned to his left and walked 40 meters. He then turned towards his left and walked 15 meters. He again turned to his right and walked 25 meters. At what approximate distance is he from the starting point and in which direction?

- 1) 60m NE 2) 35m SE 3) 67m East 4) 67m SE 5) None of these

6. A persons starts from his house and travels a distance of 10m southwards and then travels a distance of 12m rightwards, then travels distance of 10m rightwards and finally travels a distance of 10m in the eastern direction. At what horizontal distance is he from his house?

- 1) 2 m 2) 10 m 3) 12 m 4) Cannot be determined 5) None of these

Model 3: Direction before Stopping

7. Town D is to the west of town M. Town R is to the south of town D. Town K is the East of Town R. Town K is towards which direction of town D?

- 1) South 2) East 3) North-East 4) South-East 5) None of these

8. Suresh started walking straight facing east. After walking distance 20 meters, he took a right turn, again after walking 10 meters, he took a left turn, and again after walking 10 meters, he took a left turn. Which direction is he facing now?

- 1) East 2) West 3) North 4) North-West 5) None of these

9. Raman started from point P and walks towards south and stops at point Q. He now takes a right turn followed by a left turn and stops at point R. He finally takes a left turn and stops at point S. if he walks 5 Km before taking each turn, towards which direction will Raman have to walk from point S to reach point Q?

- 1) North 2) South 3) West 4) East 5) North west

Model 4: Problems on Shadows

10. If at 3pm the shadow of a person is on his right then the person is facing which direction?

- 1) North 2) South 3) East 4) West 5) None of these

11. One morning Uday and Vishal were talking each other face to face at a crossing. If Vishal's shadow was exactly to the left of Uday, which direction was Uday facing?

- 1) East 2) West 3) North 4) South 5) None of these

12. One evening before Sunset, Rekha and Hema were talking to each other face to face. If Hema's shadow was exactly to the right of Hema, which direction was Rekha facing?

- 1) North 2) South 3) East 4) Data inadequate 5) None of these

Answers

1(i)- 1	1(ii)- 4	1(iii)- 5	2 - 3	3 - 1	4 - 1	5 - 4	6 - 1	7 - 4	8 - 3
9 - 1	10 - 1	11 - 3	12 - 2						