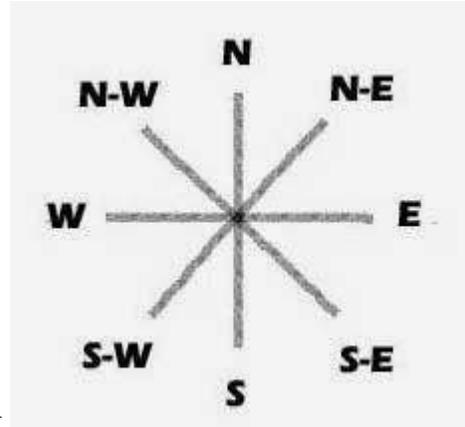


5.Direction Sense Tricks

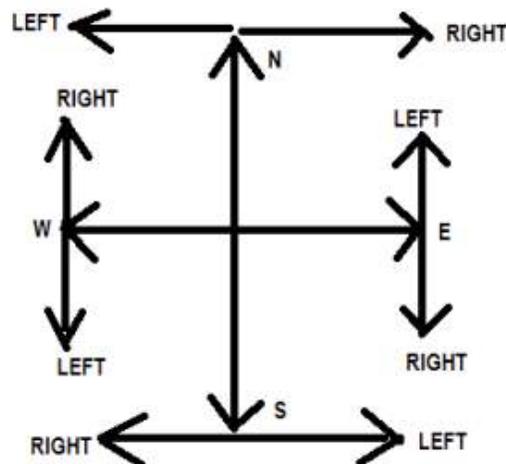
To keep track of direction is primarily based on the sun or the Pole Star. We know that the sun rises in the east and sets in the west, so there are four major directions that we prepared based on positioning of the sun, which are South, East, North and West and four sub directions are North-



East, South-East, North-West and South-West.

Direction Sense Test

The main aim of this type of examination is to test the candidate's knowledge of direction and ability to trace and follow or we can say sense the path or direction. Now In this type of direction sense test problems, what we have to do is to make a diagram as quickly as possible on a paper as per the question given. The direction sense test problems involves a person moving in the given directions and the candidate is asked to find out the distance from the initial point or direction in which the person in the question is standing etc.



Memory tool

For example you are given a question like this:

Question: Mohan starts to walk towards east from his home and traveled 15meters. He then takes a left turn and walked 10m. again he takes a right turn and walked 07m finally he takes a right turn and walks 10m and takes his destination. So how far is he from his starting position and which direction is he facing?

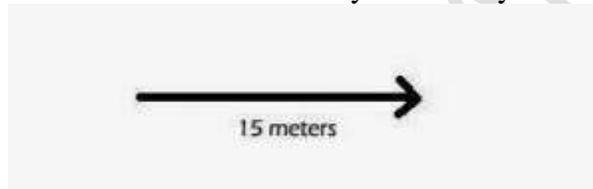
And the options are:

- 22 meters west
- 22 meters east
- 22 meters south-west
- 22 meters north-east

Solution: For solving the question, you might take to draw a diagram on paper. For example consider 2cm as a 5m, You have to think that you are travelling the distance. The most important thing to care about is 'in which direction the person starts'. So read the question very carefully first and then start as the given points of solution are below:

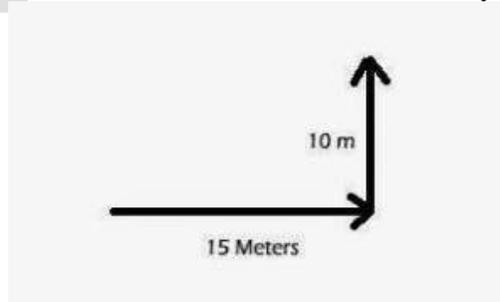
In the question above the person Mohan starts walking in east direction as given.

- Mohan starts to walk towards east and walk 15 meters, Make a line going straight up as given below and mark it 15m. think yourself as you have traveled 15m in the east



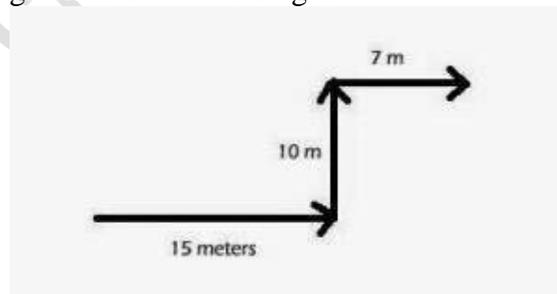
direction.

- Now as per the question, Mohan takes a left turn and walks 10m. so move your line to

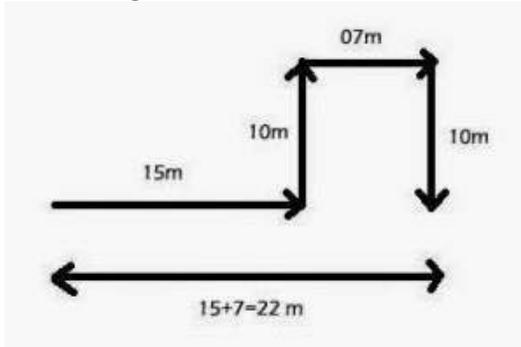


10m in left direction as shown below.

- Again Mohan takes a right turn and walks 07m. so again move your line to 07m right as given below in the diagram.



- At last he takes a right turn and walks 10m. so again move your line to 10m right as given below diagram.



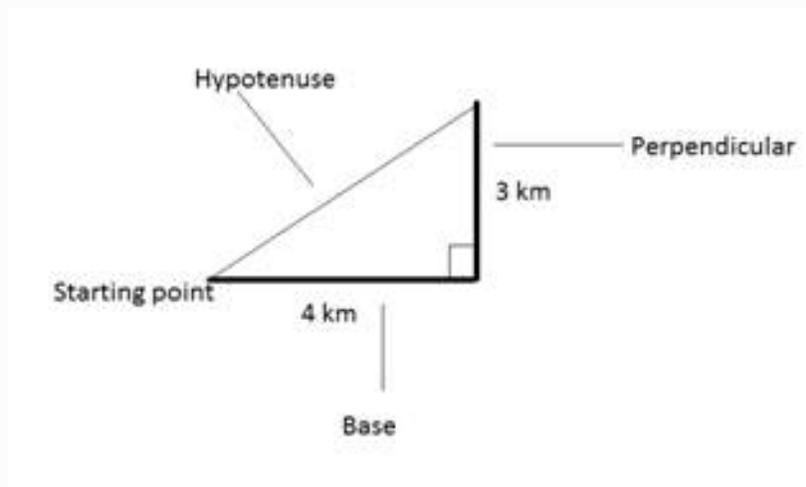
- Finally with the help of last diagram, you can easily find out which direction Mohan is facing.
Answer: So Mohan is $15+07 = 22$ meters far from his home and direction he is facing is east.

If I move 4 km towards east and then I travel 3 km towards north. What is my distance from the starting point?

Remember your starting point is always the centre of the direction map.

Solution:

First of all, draw the map according to the directions



It is a right angled triangle so by Pythagorean theorem

$$\begin{aligned}H^2 &= P^2 + B^2 \\ &= 3^2 + 4^2 \\ &= 9 + 16 \\ &= 25\end{aligned}$$

$$H = 5$$

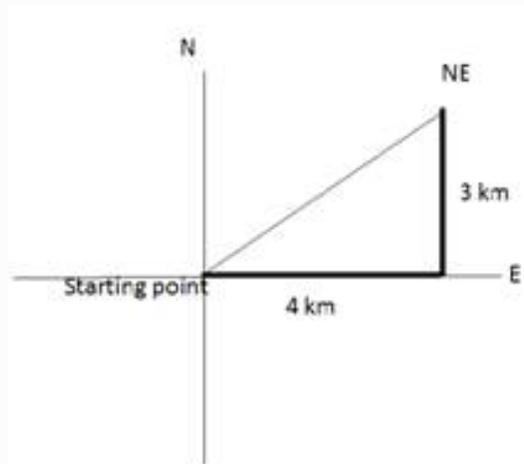
So I am at a distance of 5 KM from the starting point.

Similarly you can be asked to find the direction

If I move 4 KM towards east and then I travel 3 Km towards north. In which direction I am from the starting point?

Solution:

Draw the map and try to superpose the direction map like this

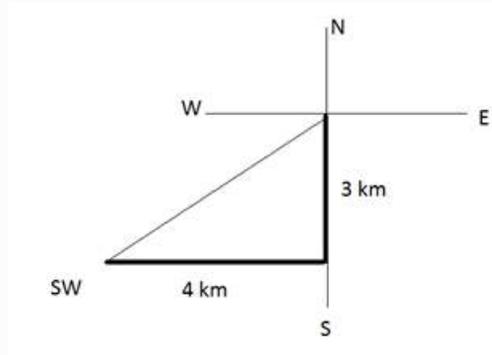


Now it is quite clear from the map that I am in NE direction from the starting point.

This question can also be asked in a different way like :

In which direction I am from my final position ?,

Now scenario will change and the final position would act as the centre of the map.



It is clear from the map I am in SW direction from my starting position.

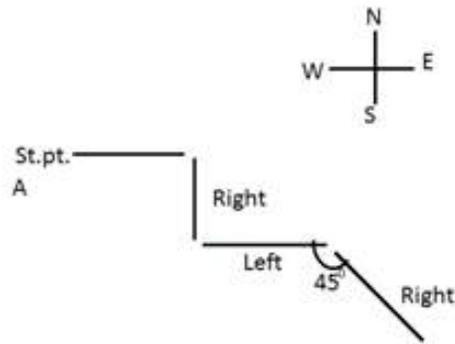
There are a few thing that you need to keep in mind while solving these questions

1. Direction : N S E W
2. Left –Right
3. Straight / opposite
4. Sunrise and sunset

A person starts from position A. He goes towards the east and then takes a right turn .Again the person takes a left turn and moves and then again he move 45 degree right. In which direction he is from the starting position?

Solution;

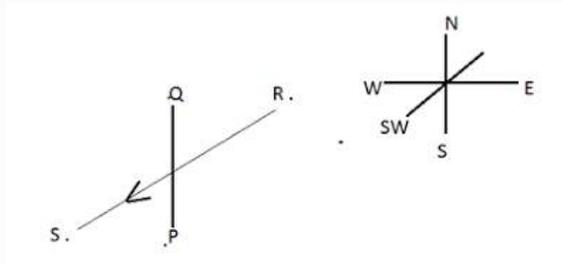
Consider yourself as the person and draw the map.



It is clear that he is in the SE direction the starting point.

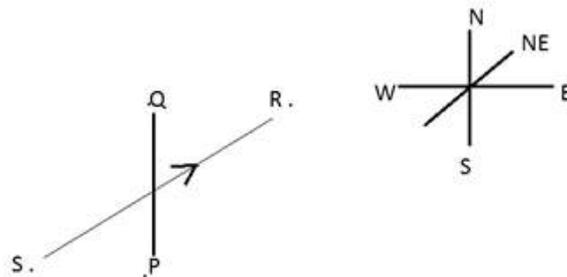
A person P is standing at a point , another person Q is standing in the north of P. Q's friend R is in right of Q and P's friend S is standing left of P. In which direction R is standing with respect to S.

Solution:



It is clear from the picture with respect to R , S is SW direction.

In which direction is S with respect to R ?



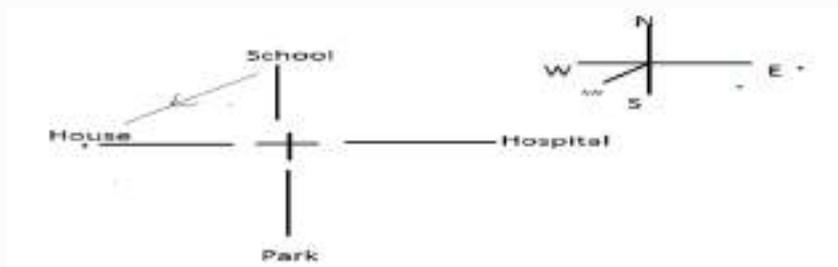
It is clear that with respect to R, S is in the NE direction.

I start from my house and go straight and come at a cross road. The road which is coming from opposite direction ends at a hospital. When I walk from my house and turn right, there is a park on that road and opposite to park there is a school. What would be the direction of my house from the school.

Solution:

If it is straight, we can assume any direction.

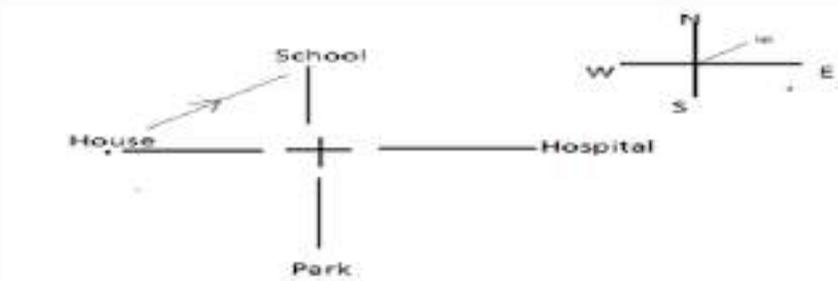
Here the assumed direction is EAST.



My house is in the SW from the school.

What would be direction of school from my house ?

Solution:



Clearly school is NE direction from the school.

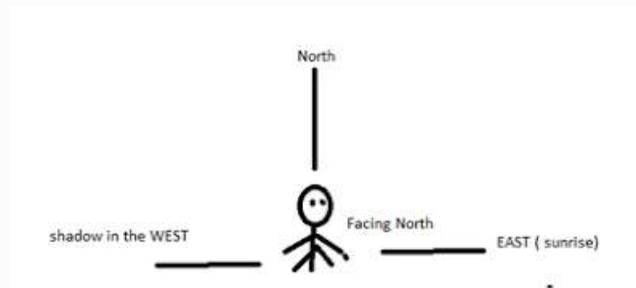
SUNRISE and SUNSET

Sun rises in the EAST then its shadow will be in the WEST.

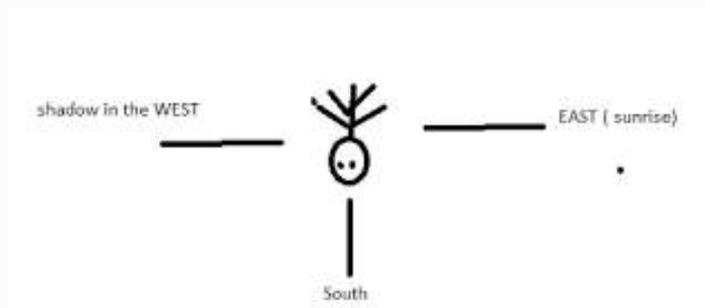
Sun sets in the WEST then its shadow will be in the EAST.

A man is facing towards the NORTH. At sunrise where will his shadow be? And if he is facing SOUTH. Then where will his shadow be?

Solution:



If he is facing NORTH, his shadow will be in the WEST or in the left of the person.



And if he is facing South, then also his shadow will be in the WEST or in the RIGHT of the person.

At a glance

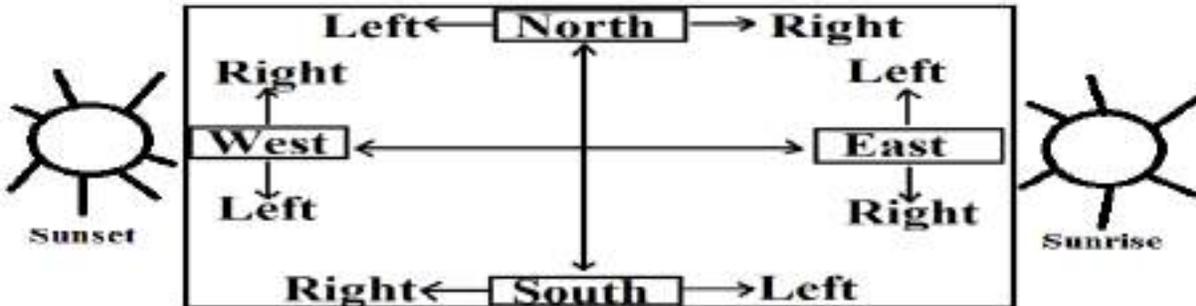
Direction is a measurement of position of one thing with respect to another thing.

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).

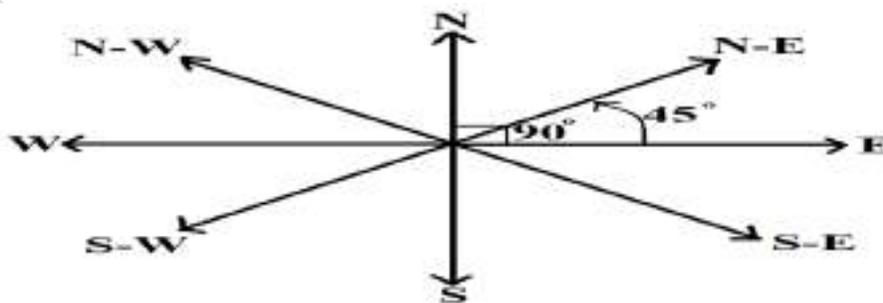
Cardinal Directions

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.

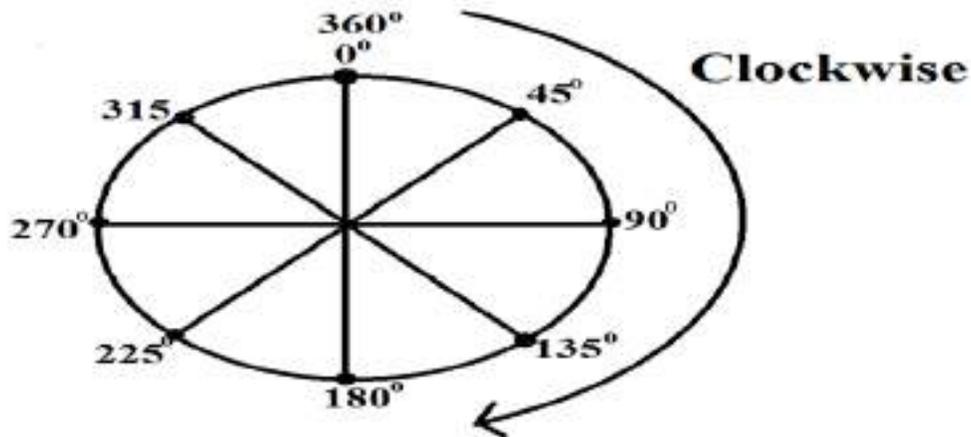


Note:- Angle formed between two main directions is 90° and angle formed between a cardinal direction and main direction is 45°

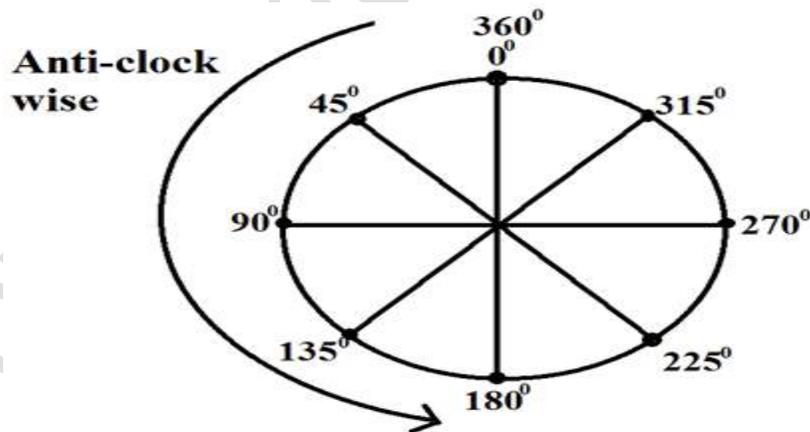
Rotation of Angles

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 $\sqrt{P^2 + Q^2}$.

Phythogoras Thorem

- 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

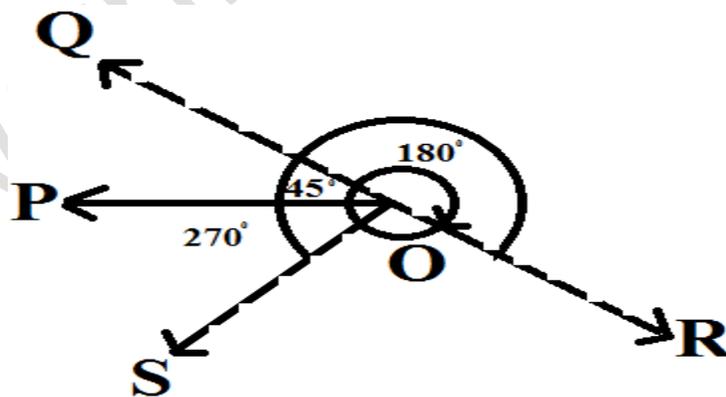
Type 1. Final Direction Based

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.

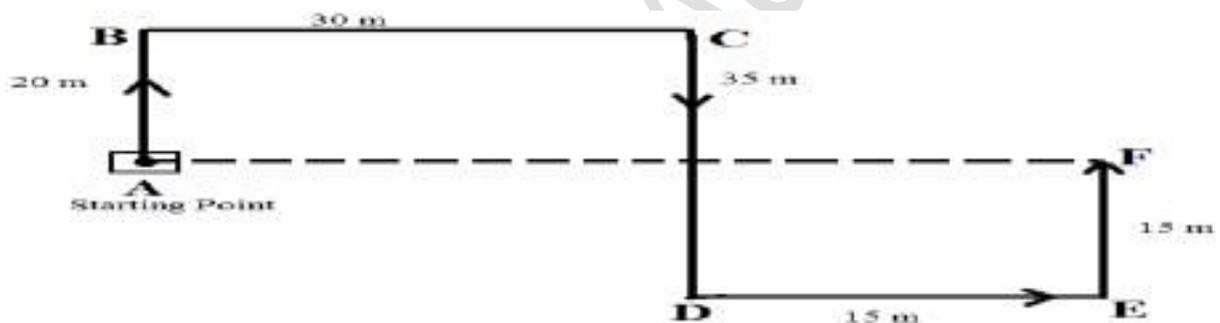
Type-2 Distance (Displacement) Based

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'.

Type-3. Distance (Displacement) and Direction Based

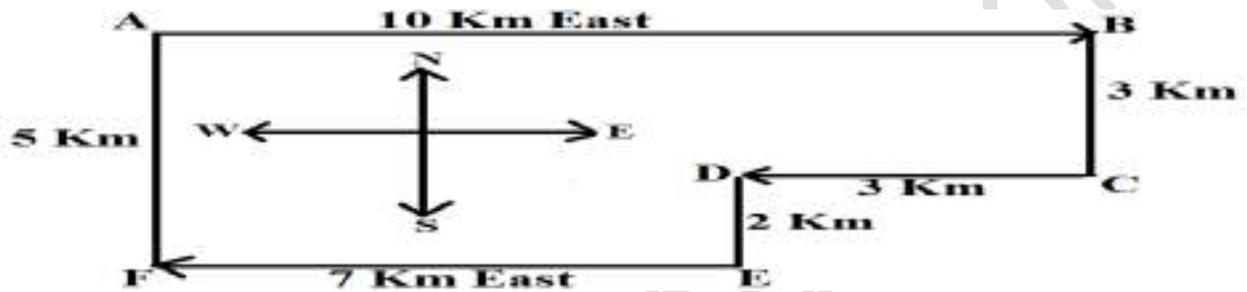
In this type of questions, we deal with the final distance between starting and final point of any person/object/thing. There are various formats/patterns of distance and direction.

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)



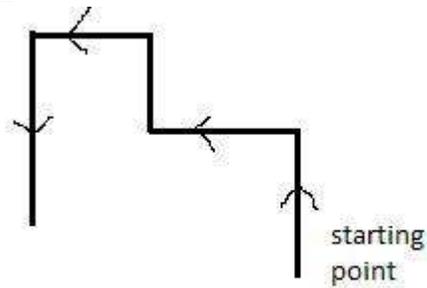
Required distance $AF = BC + DE = 3 + 2 = 5$ Km

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

1. **Riya starts walking in the north direction and after walking some distance she took a left turn followed by a right turn. After that she took two consecutive left turn, now she is walking in which direction?**
 - a) south
 - b) north
 - c) east
 - d) west
 - e) None of these

Answer & Explanation

Answer – a) south

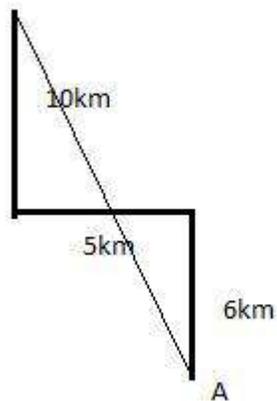


Explanation :

2. **Rahul walks a distance of 10 km towards south, then he turn to his left and walks 5 km. From here he took a right turn and walks 6 km and stops at a point A. Find the distance between the starting point and A and A is in which direction with respect to starting point.**
- 17km, north east
 - 17km south east
 - 17km north west
 - 17km south west
 - None of these

Answer & Explanation

Answer – b) 17km south east



Explanation :
(approx.)

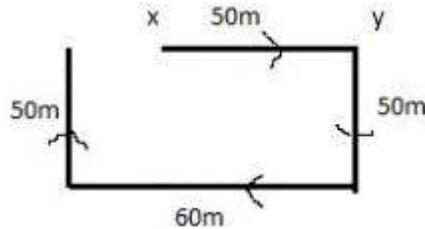
$$\text{Distance} = 16^2 + 5^2 = \sqrt{281} = 17\text{km}$$

3. **Neha travelled from a point X straight to point Y at a distance of 50 meters. He turned to his right and walks 50 meter more, then again turned right and walks 60 meter. Finally, he turned to right and walks 50 meters. How far is he from the starting point?**
- 10
 - 20
 - 30

- d) 40
e) None of these

Answer & Explanation

Answer – a) 10

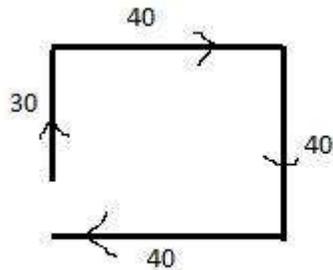


Explanation :

4. Nishant walks 30 meter in the north direction, after that he took a right turn and walks 40 meter. After that he took a right turn and walks 40 meter more and finally he took a right turn and stop after walking 40 meter. Find the distance of nishant from the initial position?
- a) 5
b) 10
c) 15
d) 20
e) None of these

Answer & Explanation

Answer – b) 10



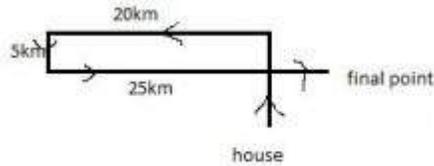
Explanation :

5. From his house, Ram went 15 kms to the north. Then he turns west and covered 20 km. Then he turned south and covered 5 km. Finally turning to east, he covered 25 km. In which direction is he from his house?
- a) north west
b) north east
c) south east

- d) south west
- e) None of these

Answer & Explanation

Answer – b) north east

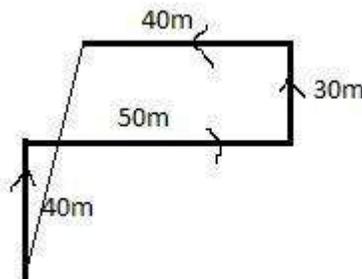


Explanation :

6. A man walks 40 meters towards north. Then turning to his right, he walks 50 meter. Then turning to his left, he walks 30 meters. Again he turns to his left and walks 40 meters. How far is he from initial position?
- a) $40\sqrt{2}$
 - b) $50\sqrt{2}$
 - c) $60\sqrt{2}$
 - d) $50\sqrt{3}$
 - e) None of these

Answer & Explanation

Answer – b) $50\sqrt{2}$

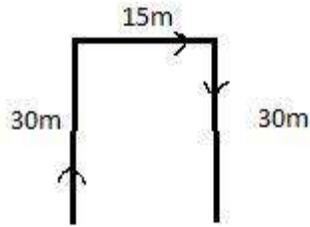


Explanation :
 $= \sqrt{5000} = 50\sqrt{2}$

$$\text{Distance} = \sqrt{(70^2 + 10^2)}$$

7. Riya goes 30 km towards North from a fixed point, then after turning to her right she goes 15 km. After this she goes 30 km after turning to her right. How far and in what direction is she from her starting point?
- a) 10m east
 - b) 15m east
 - c) 20m east
 - d) 25m east
 - e) None of these

Answer & Explanation



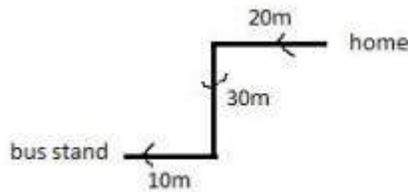
Answer – b) 15m east

8. A person starts walking from his home in west direction and after walking 20 meter he took a left turn and walk 30 meters. Now he took a right turn and walks 10 meter to reach the bus stand. Find the distance between home and stand

- a) $20\sqrt{2}$
- b) $30\sqrt{2}$
- c) $40\sqrt{2}$
- d) $50\sqrt{2}$
- e) None of these

Answer & Explanation

Answer – b) $30\sqrt{2}$



Explanation :

$$= 30\sqrt{2} \text{ m}$$

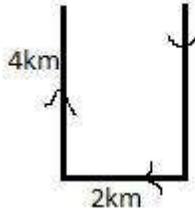
$$\text{Distance} = \sqrt{(30^2 + 30^2)}$$

9. A girl rides her bicycle southwards, then turned right and rode 2 km and again turned right and rode 4 km. She found himself exactly 2 km east from the starting point. How far did she ride southwards initially?

- a) 2km
- b) 3 km
- c) 4 km
- d) 6 km
- e) None of these

Answer & Explanation

Answer – c) 4 km



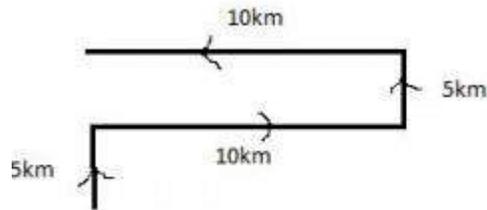
Explanation :

10. One day raj left home and walked 5 km northwards, turned right and walked for 10km and turned left and walked 5 km more and finally turned left and walked 10km. How many kilometres will he have to walk to reach his home straight?

- a) 15 km
- b) 10 km
- c) 5 km
- d) 20 km
- e) None of these

Answer & Explanation

Answer – b) 10 km



Explanation :