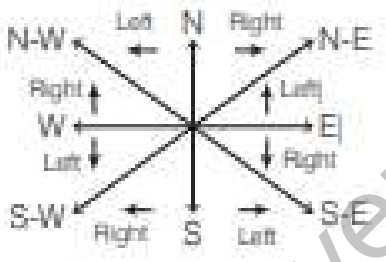
CHAPTER 07

Direction Sense Test

Direction sense test deals with a sort of direction puzzle. A successive follow up of directions is formulated and the candidate is required to find the final direction or the distance between two points.

To solve the questions based on direction sense test the candidates must have knowledge of some important concepts, which are given below.

1. The four main directions are North (N), South (S), East (E) and West (W) and four cardinal directions are North-East (NE), North-West (NW), South-East (SE) and South-West (SW).



2. Pythagoras theorem,

$$AC^2 = AB^2 + BC^2$$

i.e. $$AC = \sqrt{AB^2 + BC^2}$$

3. In the morning, sunrises in the East, the **shadow of person** or object falls in the West. In the evening, the sunset in the West, the shadow of a person or object falls in the East.

4. Movement in the direction of clock is called clockwise movement and in the opposite direction to that of clock is called anti-clockwise movement

The different types of questions which are asked in exams related to direction sense test are as given below.

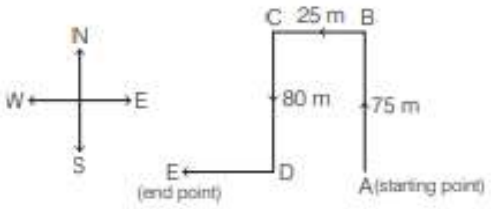
1. Finding Out the Final Direction- In this type, questions are based on final direction of a person/object or direction of a person with respect to starting point.

Example 1: Deepa moved a distance of 75 m towards the North. She then turned to the left and walking for about 25 m, turned left again and walked 80 m.

Finally, she turned to the right. In which direction was she moving finally?

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

Sol. (c) According to the given information,



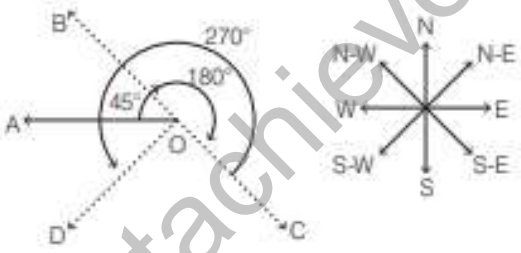
Clearly, she is moving towards West.

Example 2: A man is facing West. He turns 45° in the clockwise direction and then another 180° in the same direction and then 270° in the anti-clockwise.

Which direction is he facing now?

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

Sol. (d) According to the given information

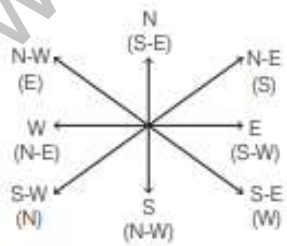


Clearly, he is facing South-West now.

Example 3: If S-E becomes West, N-E becomes South and so on. **What will North become?**

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

Sol. (c) The directions are as follow

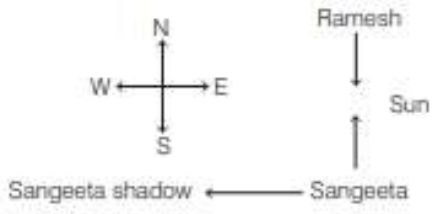


Clearly, North will become South-East.

Example 4: Early morning after sunrise Sangeeta went for a walk. Her brother, Ramesh, who was coming towards, her from opposite direction, saw that Sangeeta's shadow had fallen to his right. From which direction was Ramesh coming?

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

Sol. (b) The direction will be as follows.



Clearly, Ramesh was coming from North.

Example 5: In a clock at 12:30, hour needle is in North direction while minute needle is in South direction. **In which direction would be minute needle at 12:45?**

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

Sol. (c) The hour hand of the clock is North direction and minute hand is in South direction

As, it is clear from the above diagram that minute hand is in West direction.

2. Finding the Total Distance- The starting and end points are marked using left and right turns and the distance is calculated between them.

If there is no straight distance, then distance is calculated using Pythagoras theorem, i.e.

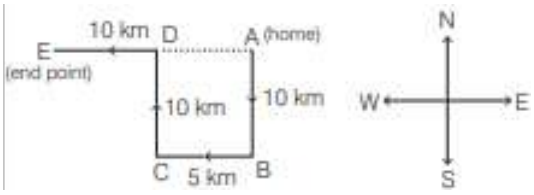
In this type of questions, the candidate have to find the final distance between the starting and final points or distance between two points / persons / things.

Example 6: One day, Ravi left home and cycled 10 km Southwards, turned right and cycled 5 km and turned right and cycled 10 km and turned left and cycled 10 km.

How many kilometres will he have to cycle to reach his home straight.

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

Sol. (b) According to the given information,



Thus, his distance from initial position A

= AE = AD + DE = BC + DE

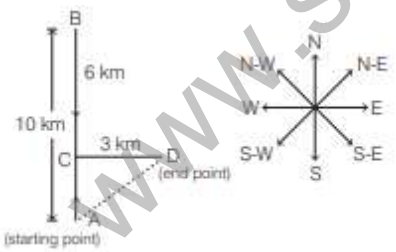
= (5 + 10)5 10 km = 15 km

3. Finding the Direction and Distance- In this type of questions, the candidate have to determine both the distance and direction.

Example 7: Kunal walks 10 km towards North. From there, he walks 6 km towards South. Then, he walks 3 km towards East. How far and in which direction is he with reference to his starting point?

(a) 5 km, West (b) 7 km, West (c) 7 km, East (d) 5 km, North-East

Sol. (d) According to the given information,



Then, AC = (AB – BC) = (10 – 6) = 4 km

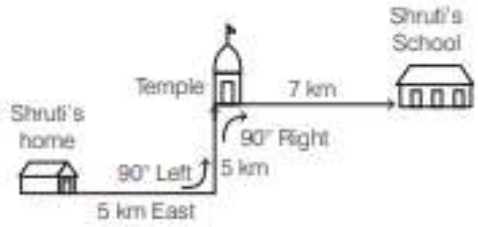
Kunal's distance from starting point A

$$AD = \sqrt{AC^2 + CD^2} \quad \text{(Pythagoras theorem)}$$
$$= \sqrt{4^2 + 3^2} = 5 \text{ km}$$

Also, D is to the North-East of A.

4. Questions Based on Map- In these questions, a map of a journey of a man from his starting point to end point is given. On the basis of this map the candidates are required to determine the position of starting point with respect to end point, position of end point with respect to starting point or the position of other place with respect to starting or end point.

Directions (Ex. Nos. 8 and 9) Analyse the following information and answer the questions based on it. The map of Shruti's journey from her home to school is given below



On the basis of above map, answer the questions given below.

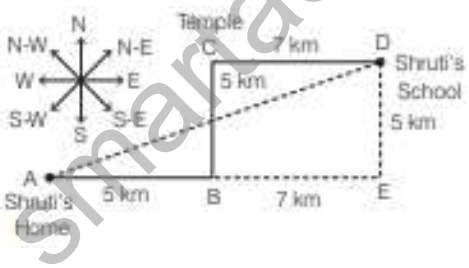
Example 8: The direction of Shruti's school with respect to her home is

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

Example 9: The shortest distance between Shruti's school and her home is

(a) 14 km (b) 12 km (c) 13 km (d) 10 km

Sol. (Ex. Nos. 8 and 9) According to given information,



8. (b) From the given diagram, Shruti's school is in North-East direction with respect to her home.

9. (c) From the given diagram,

BE = CD = 7 km

Then, AE = 5 + 7 = 12 km

and DE = CB = 5 km

$$\therefore \text{ Shortest distance, AD} = \sqrt{(AE)^2 + (ED)^2}$$
$$= \sqrt{(12)^2 + (5)^2}$$
$$= \sqrt{144 + 25}$$
$$= \sqrt{169}$$
$$= 13 \text{ km}$$

Practice Questions

1. A boy goes in South direction, then he turns towards left and travels for some distance. After that he turns right and moves certain distance. At last he turns left and travel again for some distance. **Now, in which direction is he moving?**

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

2. I was facing East from where I turned to my left and walked 12 ft, then I turned towards right and walked 6 ft, After that I walked 6 ft in South direction and at last I walked 6 ft in the West. **Then, in which direction am I standing from the original point?**

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

3. Ram is to the South of Aishwarya and to the West of Rani. If Priyanka is to the South of Ram, then in which direction is Priyanka with respect to Rani?

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

4. There are four roads. I have come from the South and, want to go the temple. The road to the right leads me towards the coffee house while straight road leads to the college. In which direction is the temple?

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

5. I am facing North. I turn 135º in clockwise direction, then 180º in anti-clockwise direction. What direction am I facing now?

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

6. Rama is facing East. He turns 90º in clockwise direction, and then 135º in anti-clockwise direction and then again 90º in clockwise direction. Which direction is she facing now?

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

7. A person walks away from his house at 8:00 am and observes his shadow to his right. Then, he turns towards his left and then again towards his right. Which direction is he facing now?

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

8. One day, during Sunset, two friends Sudhir and Amit were talking, facing each other. If Amit's shadow was on his right then in which direction is Aman facing? If Aman faces the direction opposite of what Sudhir is facing?

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

9. The time in a clock is quarter past twelve. If the hour hand points to the East, then towards which direction the minute hand is pointing?

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

10. 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 what direction actually she was travelling?

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

11. While facing East you turn to your left and walk 10 yards. Then, turn to your left and walk 10 yards and now turn 45° to your right and go straight to cover 50 yards. Now, in what direction are you with respect to the starting point?

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

12. A house faces North. A man coming out of his house walked straight for 10 m, turned left and walked 25 m. He then turned right and walked 5 m and again turned right and walked 25 m. How far is he from his house?

(a) 15 m (b) 55 m (c) 60 m (d) 65 m

13. A cyclist goes 30 km to North and then turning East he goes 40 km. Again, he turns to his right and goes 20 km. After this, he turns to his right and goes 40 km. How far is he from his starting point?

(a) 6 km (b) 10 km (c) 25 km (d) 40 km

14. A boat moves from port towards East. After sailing for 9 miles, it turns towards right and covers another 12 miles. If it wants to go back to the port, what is the shortest distance now from its position?

(a) 21 miles (b) 20 miles (c) 18 miles (d) 15 miles

15. A cyclist rides 40 km to the East, turns North and rides 20 km, again turns left and rides 20 km. How far is he from his starting point?

(a) 0 km (b) 10 km (c) 15 km (d) 20 $\sqrt{2}$ km

16. A man travels 4 km due North, then travels 6 km due East and further travels 4 km due North. How far is he from the starting point?

(a) 6 m (b) 14 km (c) 8 km (d) 10 km

17. A and B starts walking from same point. A goes North and covers 3 km, then turns right and covers 4 km. B goes West and covers 5 km. Then, turns right and covers 3 km. How far apart are they from each other?

(a) 10 km (b) 9 km (c) 8 km (d) 5 km

18. Rohit walked 25 m towards South. Then he turned to his left and walked 20 m. He then turned to his left and walked 25 m. He again turned to his right and walked 15 m.

At what distance is he from his starting point and in which direction?

(a) 35 m, East (b) 35 m, North (c) 40 m, East (d) 60 m, East

19. Starting from a point P, Rohan walked 20 m towards South. He turned left and walked 30 m. He then turned left and walked 20 m. He again turned left and walked 40 m and reached point Q. How far and in which direction is the point Q from the point P?

(a) 20 m, West (b) 10 m, East (c) 10 m, West (d) 10 m, North

20. Mohan left for his office in his car. He drove 15 km towards North and then 10 km towards West. He then turned to the South and covered 5 km. Further he turned to the East and moved 8 km. Finally, he turned right and drove 10 km. How far and in which direction is he from his starting point?

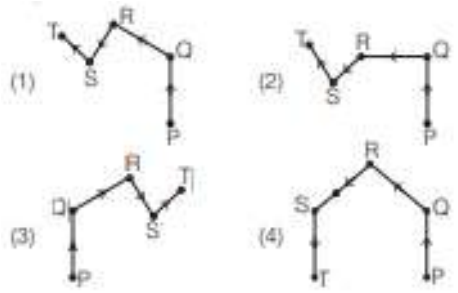
(a) 2 km, West (b) 5 km, East (c) 3 km, North (d) 6 km, South

21. Ramesh walks 10 m towards South. Turning to the left, he walks 20 m and then moves to his right. After moving a distance of 20 m, he turns to the right and then walks 20 m. Finally, he turns to the right and moves a distance of 10 m. How far and in which direction is he from the starting point?

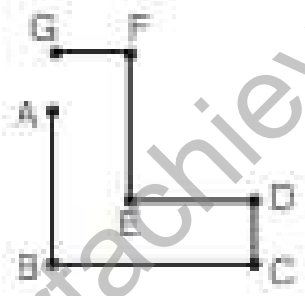
(a) 10 m, North (b) 20 m, South (c) 20 m, North (d) 10 m, South

22. Raju starts from a place P towards North and reaches place Q. From there, he turns towards North-West and reaches place R. Then, he turns towards South-West and walks to a place S. From there, he turns towards North-West and finally reaches place T.

Which of the following figures shows the movement of Raju?



Directions (Q. Nos. 23 and 24) In the below diagram, the position of seven points are shown.



Here, Point A is 11 m North of point B. Point C is 11 m East of point B. Point D is 6 m North of point C. Point E is 7 m West of point D. Point F is 8 m North of point E. Point G is 4 m West of point F.

On the basis of the above information, answer the questions asked.

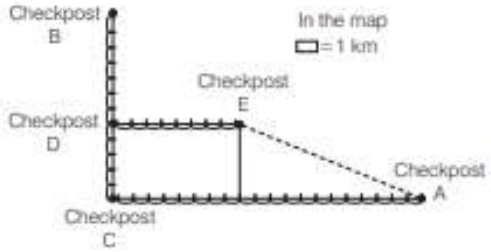
23. How far is point F from point A?

(a) 43 m (b) 4 m (c) 3 m (d) 5 m

24. How far and in which direction is point G from point A?

(a) 3 m, North (b) 5 m, North (c) 4 m, North (d) 4 m, South

Directions (Q. Nos. 25-26) In the following map the position of 5 checkposts A, B, C, D and E are shown.



Study the map carefully and answer the questions asked.

25. If a checkpost A is in the East direction of checkpost C, then in which direction is the checkpost B which respect to chckpost A?

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

26. Find the shortest distance between checkpost E and checkpost A.

(a) 17 km (b) 13 km (c) 18 km (d) 20 km

Directions (Q. Nos. 27 and 28) Study the following map carefully and answer the questions asked.

27. Astha is in Arihant Publications Building and can see Sharma sweets in her front which direction is she facing?

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

28. Yatharth starts from location 'P' and proceeds as follows right onto plaza st heading West, second right heading North, first left heading West and stops as location 'N'. Where is location 'O' in relation to his current location?

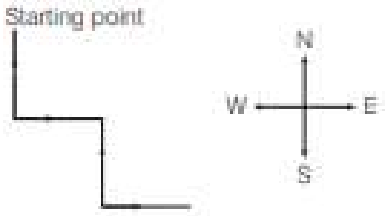
(a) South-East (b) South-West (c) North (d) East

ANSWERS

1.	(c)	**2.**	(d)	**3.**	(c)	**4.**	(d)	**5.**	(d)	**6.**	(a)	**7.**	(b)	**8.**	(a)	**9.**	(b)	**10.**	(a)
11.	(d)	**12.**	(a)	**13.**	(b)	**14.**	(d)	**15.**	(d)	**16.**	(d)	**17.**	(b)	**18.**	(a)	**19.**	(c)	**20.**	(a)
21.	(b)	**22.**	(a)	**23.**	(d)	**24.**	(a)	**25.**	(a)	**26.**	(b)	**27.**	(a)	**28.**	(a)				

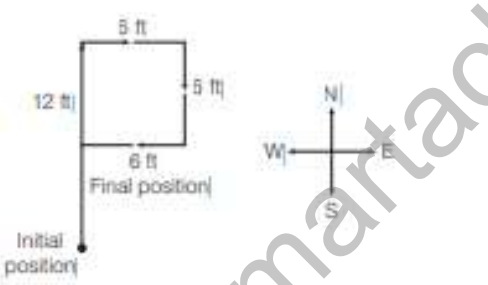
Hints & Solutions:

1. (c) The direction diagram is as follows,



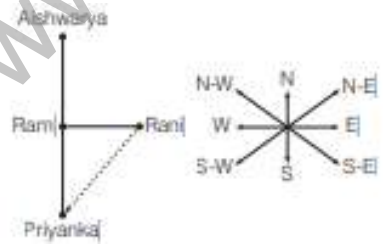
Clearly, he is moving towards East direction.

2. (b) The direction diagram is as follows,



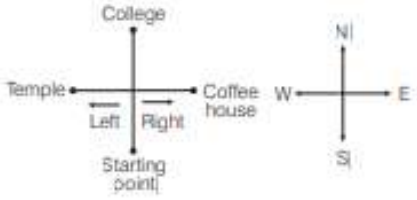
Clearly, I am towards North from my initial position.

3. (c) According to the question,



Clearly, Priyanka is towards South-West of Rani.

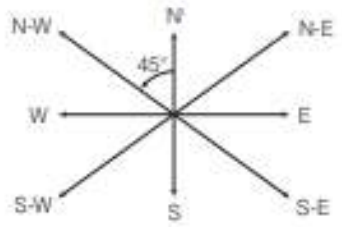
4. (d) According to the question,



Clearly, temple is towards West.

5. (d) Difference in degrees = 180º – 135º = 45º anti-clockwise.

(anti-clockwise) (clockwise)

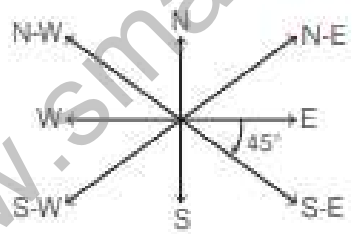


Hence, now I am facing in North-West direction.

6. (a) Clockwise turn = 90º + 90º = 180º

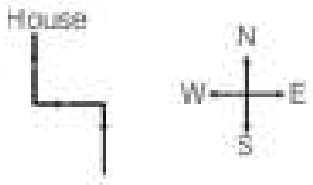
Anti-clockwise turn = 135º

Difference =180º – 135º = ° 45 clockwise



Hence, now Rama is facing in South-East direction

7. (b) According to the question, the shadow is towards his right at 8:00 am that means the person is walking towards South direction.

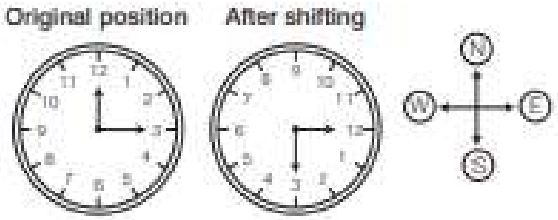


Clearly, he is facing South direction.

8. (a) According to the question, at Sunset Amit's shadow is towards his right that means he is facing North. Now, Sudhir is standing in front of him that means Sudhir is facing South. Now, Aman faces the direction opposite of Sudhir.

∴ Aman is facing North direction.

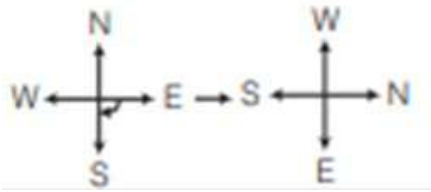
9. (b) Time quarter past twelve means that the time is 12:15.



Hence, when hour hand is pointing towards

East, then the minute hand is pointing towards

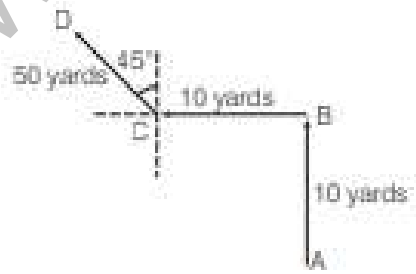
10. (a)



The, pointer which was showing West started showing South. Hence, the pointer turned 90° clockwise. Now, Sita went to the direction thinking it as West.

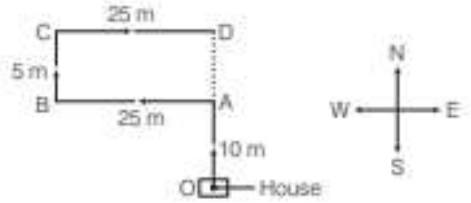
The original direction will be + 90° clockwise i.e. North direction.

11. (d) Let A be the initial position of the man. He initially faced East and then turned his left in the direction of North and walked 10 yards.



Then, turned his left in the direction of West and walked 10 yards. Now, he turned 45° to his right and walked 50 yards straight in the same direction. Now, the direction of the man with respect to his starting point is North-West.

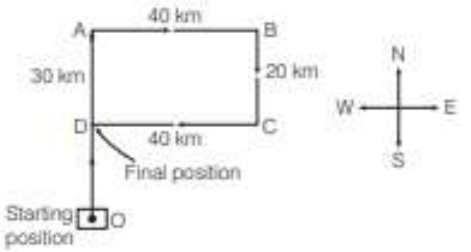
12. (a) According to the question,



∴ Required distance = OD = OA + AD

= OA + BC = 10 + 5 = 15 m

13. (b) According to the question,



∴Required distance, OD = OA – AD

= OA – BC = 30 – 20 = 10 km

14. (d) According to the question,

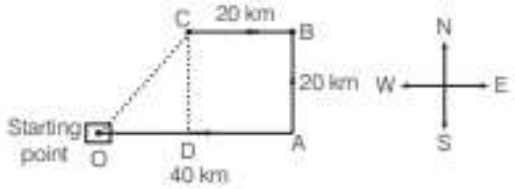
∴ Required distance, $OB = \sqrt{OA^2 + AB^2}$

[using Pythagoras theorem]

$= \sqrt{9^2 + 12^2}$

$= \sqrt{225} = 15$ miles

15. (d) According to the question,

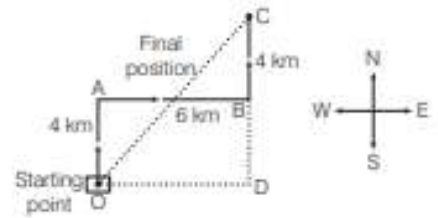


In ΔOCD, OD = OA – AD = OA − BC

= 40 – 20 = 20 km

and CD = AB = 20 km

16. (d) According to the question,



In ΔOCD, and OD = AB = 6 km

⇒ CD = BC + BD

= BC + OA

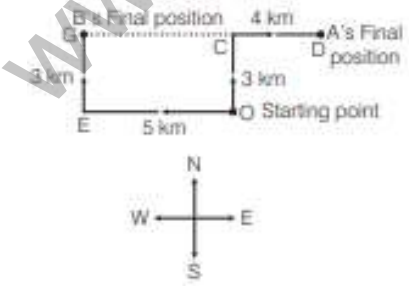
= 4 + 4 = 8 km

Now, required distance

$OC = \sqrt{OD^2 + CD^2}$

$= \sqrt{6^2 + 8^2} = \sqrt{100} = 10$ km

17. (b) According to the question,

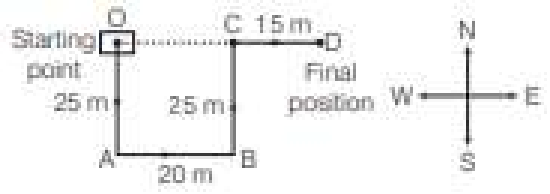


∴ Required distance, GD = GC + CD

= EO + CD

= 5 + 4 = 9 km

18. (a) According to the question,



∴ Required distance, OD = OC + CD

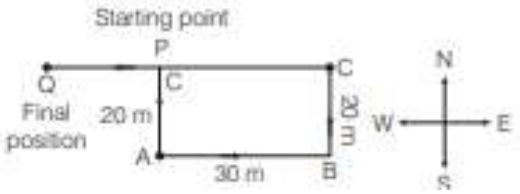
= BA + CD

= 20 + 15 = 35 m

Also, point D is to the East of point O.

∴ He is 35 m towards East from his starting point.

19. (c) According to the question,



We can see that point 'Q' is to the West of point 'P'.

Now, Required distance = PQ = QC − PC

= QC − AB

= 40 − 30 = 10 m

∴ Q is 10 m to the West of P

20. (a) According to the question,

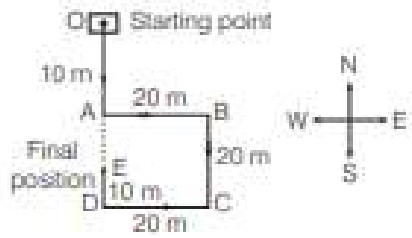
Point E is to the West of point O.

Now, required distance, EO = AB − CD

= 10 − 8 = 2 km

Hence, he is 2 km towards West from his starting point.

21. (b) According to the question,



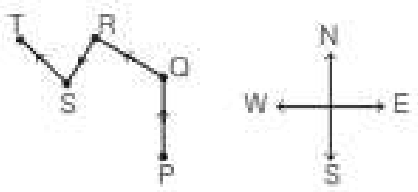
Point E is to the South of Point O.

Now, Required distance = OE = OA + AE

$$= OA + BC - ED = 10 + 20 - 10 = 20 \text{ m}$$

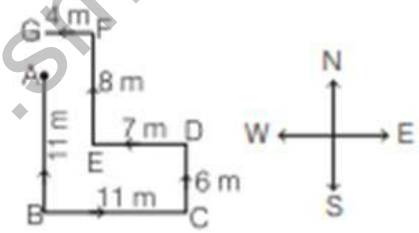
Hence, Ramesh is 20 m towards, South from his starting point.

22. (a) According to the question, the direction diagram is as given below.

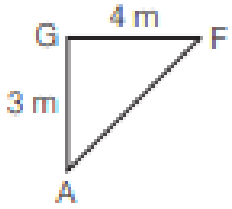


This situation is traced by option (a).

Sol. (Q. Nos. 23 and 24) According to the information, the direction diagram is as given below.



23. (d) According to the question, the direction diagram is as given below.



AG = BG – AB = (CD + EF) − AB

$= (6 + 8) - 11 = 3$ m

and GF = 4 m

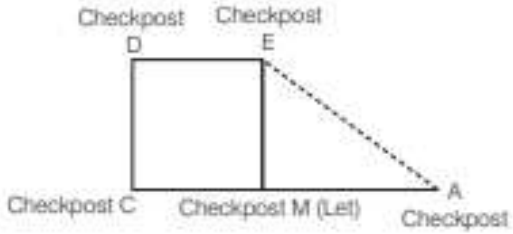
$\therefore \quad AF = \sqrt{AG^2 + GF^2}$

$= \sqrt{9 + 16} = 5$ m

24. (a) Point G is in the North direction from point A and AG = 3 m [from above solution]

25. (a) Since the checkpost A is in the East direction of checkpost C, so the checkpost B is in North-West direction with respect to checkpost A.

26. (b) According to the figure,



Distance between checkpost M and checkpost A $= 12 \times \square$

$= 12 \times 1 = 12$ km

Distance between checkpost E and checkpost M = Distance between checkpost D and checkpost C $= 5 \times \square$

$= 5 \times 1 = 5$ km

∴ Required shortest distance, EA

$= \sqrt{(MA)^2 + (EM)^2}$

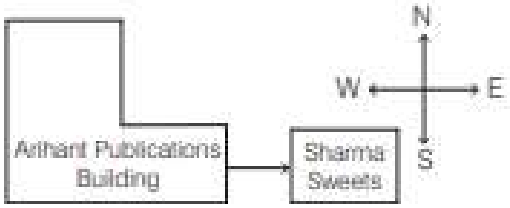
$= \sqrt{(12)^2 + (5)^2}$

$= \sqrt{144 + 25}$

$= \sqrt{169}$

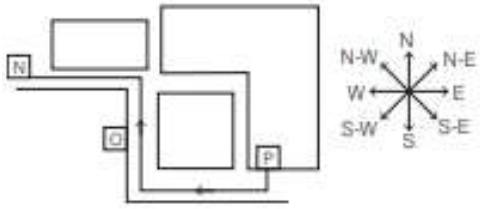
$= 13$ km

27. (a) According to the question,



Clearly, Sharma Sweets is in East direction of Arihant Publications Building, so Astha is facing towards East direction.

28. (a) According to the question,



Clearly, location O is in South-East direction in relation to his current location i.e., N.