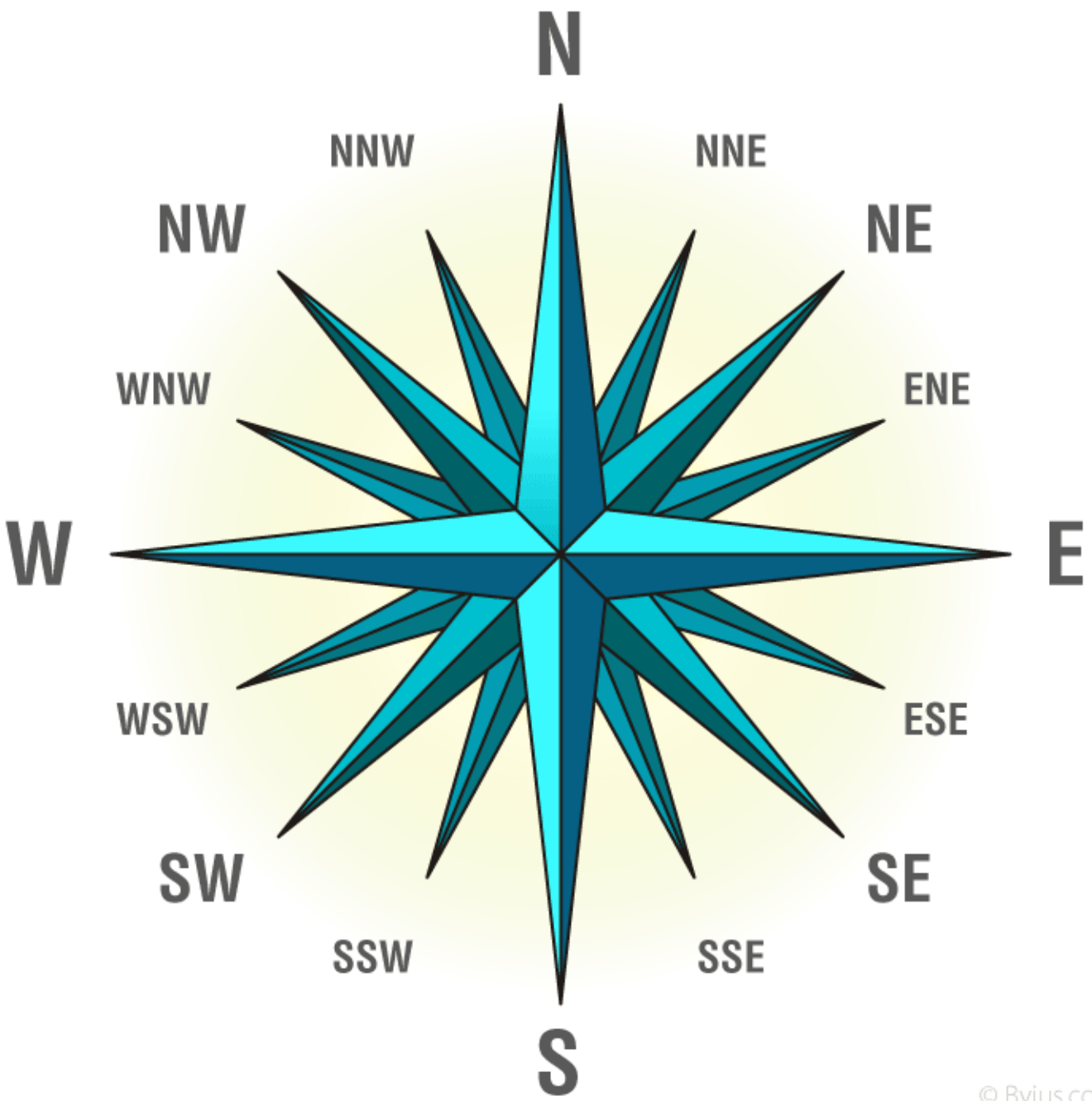
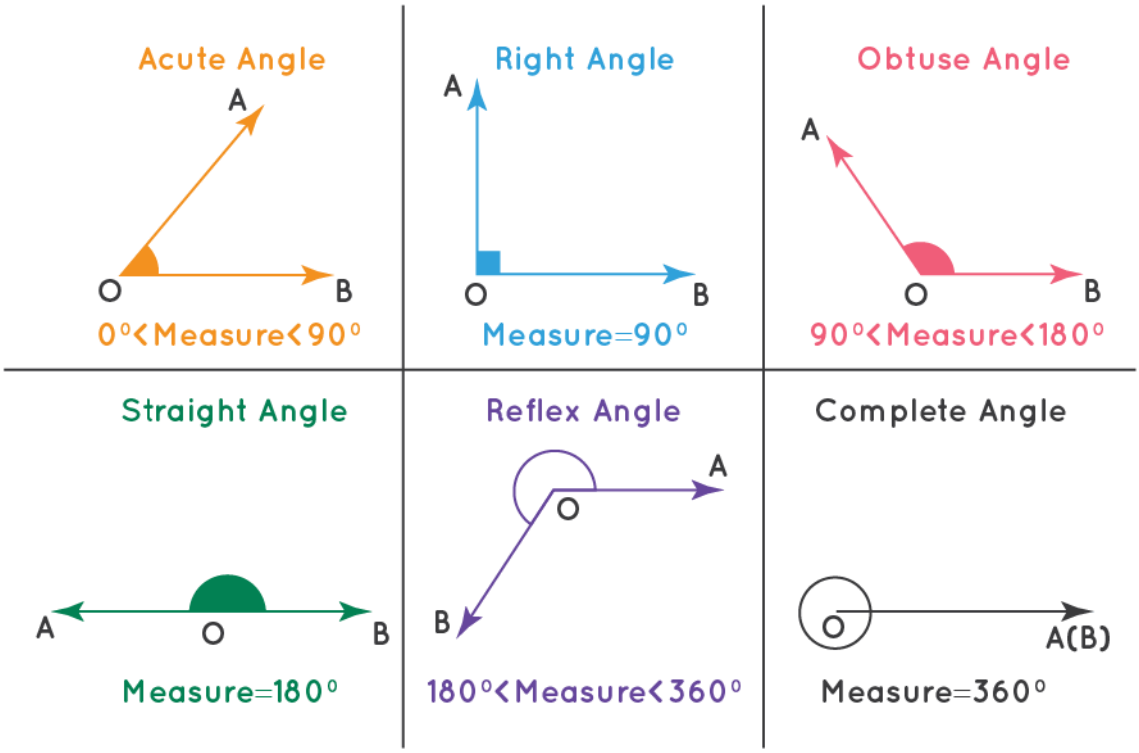
DIRECTIONS

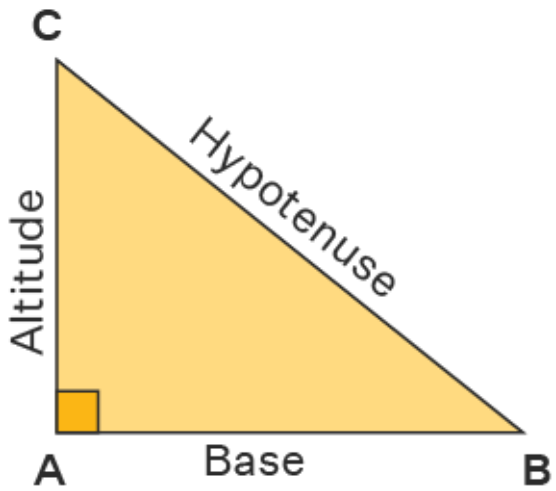
DIRECTIONS



TYPES OF ANGLES



PYTHAGORAS THEOREM



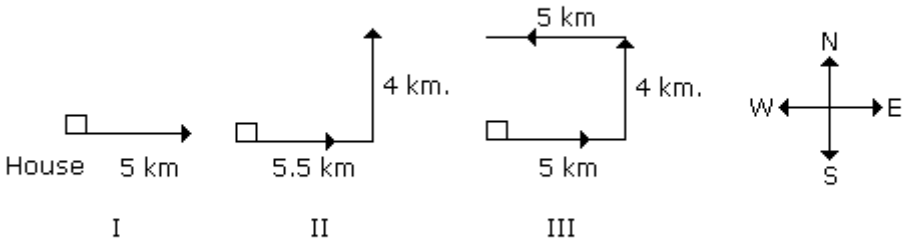
$$BC^2 = AB^2 + AC^2$$

TYPES OF QUESTIONS

Type 1: Determining the current position of a person with respect to the starting point.

Example. Siva starts from his house, goes 5 km in the East, then he turns to his left and goes 4 km. Finally, he turns to his left and goes 5 km. Now how far is he from his house and in what direction?

Solution:

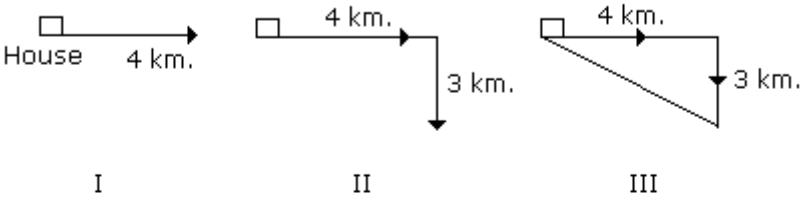


From third position it is clear he is 4 km from his house and is in North direction.

Type 2: Determining the distance between any two points that the person has traversed.

Example. Suresh starts from his house, goes 4 km in the East, then he turns to his right and goes 3 km. What minimum distance will be covered for him to come back to his house?

Solution:



$$\text{Minimum distance} = \sqrt{(4)^2 + (3)^2}$$

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

$$= \sqrt{25}$$

$$= 5 \text{ km.}$$

Type 3: Questions involving shadows of persons in the morning or evening.

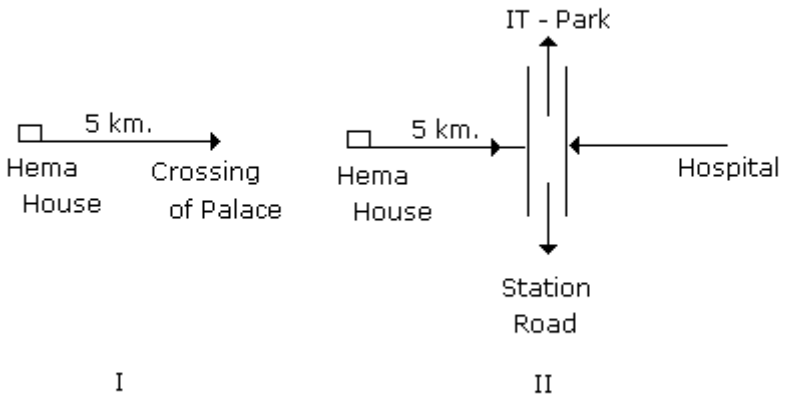
Example. One morning after sunrise Juhi while going to school met Lalli at the Boring road crossing. Lalli's shadow was exactly to the right of Juhi. If they were face to face, which direction was Juhi facing?

In the morning sunrises in the east.
So, in the morning, the shadow falls towards the west.
Now Lalli's shadow falls to the right of the Juhi. Hence Juhi is facing South.

Type 4: Determining the direction in which a person is moving.

Example. Hema starting from her house walked 5 km to reach the crossing of the Palace. In which direction she was going, a road opposite this direction goes to Hospital. The road to the right goes to the station. If the road which goes to the station is just opposite to the road which IT-Park, then in which direction to Hema is the road which goes to IT-Park?

Solution:



I II

From II it is clear that the road which goes to IT-Park is left to Hema.

PRACTICE QUESTIONS SET-1

1.If you are facing north-east and move 10 m forward, turn left and move 7.5 m, then you are

A. north of your initial position

B. south of you initial position

C. 12.5 m from the initial position

D. Both A and C

2.One day Ravi left home and cycled 10 km south wards, turned right and cycled 5 km and turned right and cycled 10 km and turned left and cycled 10 km. how many kilometers will he have to cycle to reach his home straight ?

A. 10 km B. 15 km C. 20 km D. 25 km

3.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

4.Tina drives 45 kms towards East, turns right and drives 65 kms, then turns left and drives 33 kms. In which direction is she facing now?

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

5. A man walks 15 metres south. Then turning to his right he walks 15 metres. Then turning to his left, he walks 10 metres. Again turns to his left and walks 15 metres. How far is he from his initial position?

A. 10 m B. 25 m C. 15 m D. 60 m

6.One morning, Rita started to walk toward the sun. After walking a while, she turned to her left and again to her left. After walking a while, she again turned right. Which direction is she facing now?

A. Eas B. West C. North D. South

7.One day, Nita left home and cycled 10 km southwards. Turned right and cycled 5 km and turned right and cycled 10 km and turned left cycled 10 km. How many kilometers will she have to cycle to reach her home straight?

A. 10 km B. 15 km C. 20 km D. 25 km

8.A located to the West of B. C is located at North in between A and B. D is exactly to the South of B and also in line with B. In which direction of C is D located?

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

9.Deepak walks 20 m towards North. He then turns left and walks 40 m. He again turns left and walks 20 m. Further, he moves 20 m after turning to the right. How far is he from his original position?

A. 20 m B. 60 m C. 50 m D. 30 m

10.Asha walks 3 km Southward and then turns right and walks 2 km. She again turns right and walks 3 km and turns towards her left and starts walking straight. In which direction is she walking now?

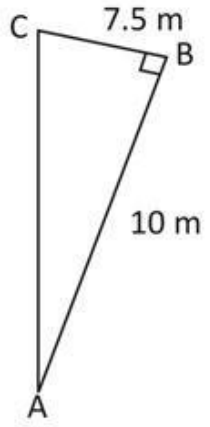
A. East B. North C. South D. West

Correct Answers:

1	2	3	4	5	6	7	8	9	10
D	B	D	A	B	C	B	B	B	D

EXPLANATIONS

1.



Clearly, the narrator starts from A, moves towards north-east a distance of 10 m up to B, turns left (90 degree anti-clockwise) and moves 7.5 m up to C. Clearly, C lies to the north of A. Also , ΔABC is right-angled at B. So,

$AC^2 = AB^2 + BC^2 = (10)^2 + (7.5)^2$

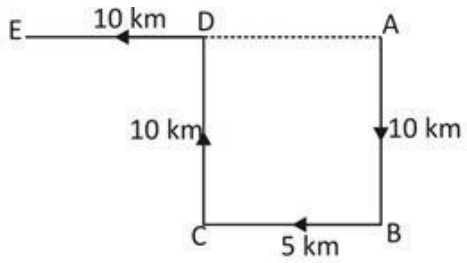
$= 100 + 56.25 = 156.25$

$$\mathrm{AC} = \sqrt{(156.25)\mathrm{m}} = 12.5\mathrm{m}$$

Thus the narrator is 12.5 m to the north of his initial position.

Hence, option D is correct.

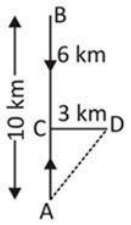
2.



Clearly, Ravi starts from home at A, moves 10 km southwards up to B, turns right and moves and 5 km up to C, turns right again and moves 10 km up to D, and finally turns left and moves 10 km up to E.

Thus, his distance from initial position A = AE + DE = BC + DE = (5 + 10) km = 15 km Hence, option B is correct.

3.

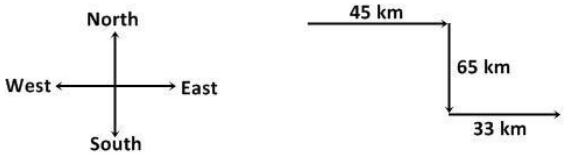


Clearly, Kunal moves from A 10 km north-wards up to B, then moves 6 km southwards up to C, turns towards East and walks 3 km up to D. Then, AC = (AB - BC) = (10 – 6) = 4 km. So, Kunal's distance from the starting point A.

$$\mathrm{AD} = \sqrt{(\mathrm{AC}^2 + \mathrm{CD}^2)} = 4^2 + 3^2 = 5\ \mathrm{km}$$

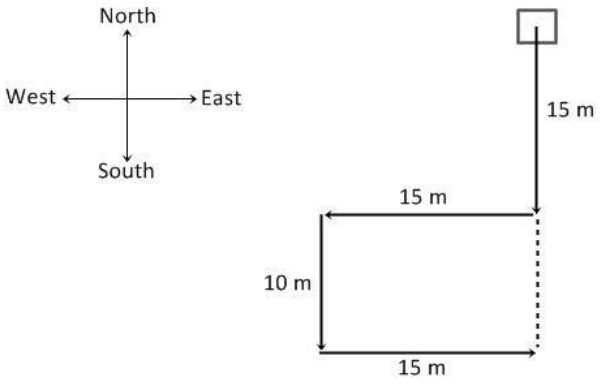
Also, D is to the North-east of A.
Hence, option D is correct.

4.



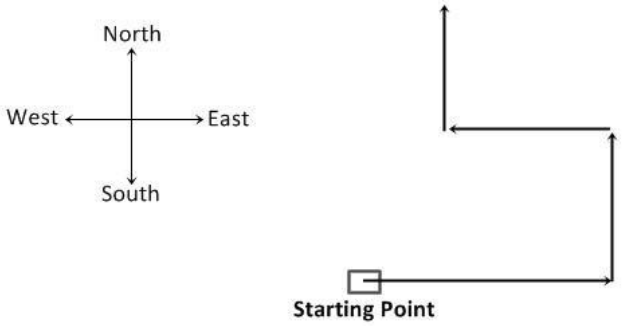
Its clear from the diagram that Tina is facing East.
Hence, option A is correct.

5.



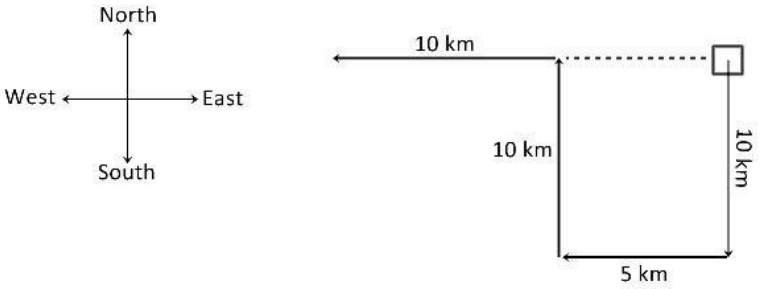
So, the total distance from the intial position = 15 m + 10 m = 25 m
Hence, option B is correct.

6.



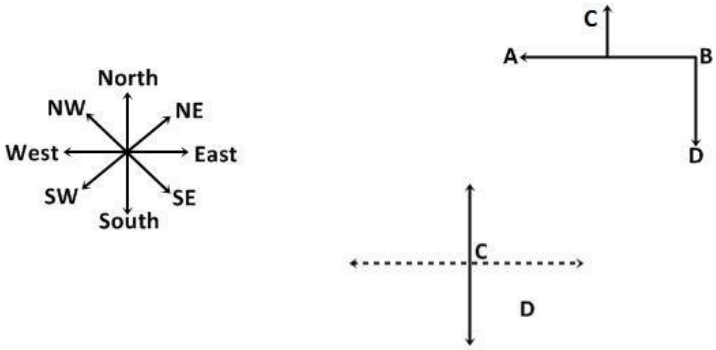
It is clear from the diagram that now Rita is facing North.
Hence, option C is correct.

7.



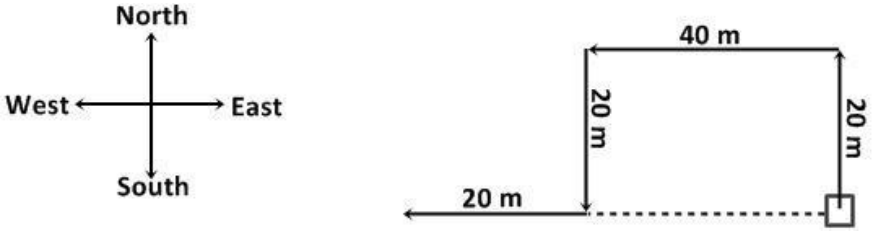
She have to cycle to reach her home straight = 10 km + 5 km = 15 km
Hence, option B is correct.

8.



Its clear from the diagram that D is SE of C.
Hence, option B is correct.

9.



Its clear from the diagram that Deepak's distance
= 20 m + 40 m = 60 m.
Hence, option B is correct.

10.

She is going to West right now.
Hence, option D is correct.

PRACTICE QUESTIONS SET-2

1.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 direction. Which direction is he facing now?

A. South B. North-west C. West

D. South-west E. None of these

2.A child is looking for his father. He went 90 metres in the east before turning to his right. He went 20 metres before turning to his right again to look for his father at his uncle's place 30 metres from this point. His father was not there. From there, he went 100 metres to his north before meeting his father in a street. How far did the son meet his father from the starting point?

A. 80 m B. 100 m C. 140 m

D. 180 m E. 260 m

3.Kailash faces towards north. Turning to his right, he walks 25 metres. He then turns to his left and walks 30 metres. Next, he moves 25 metres to his right. He then turns to his right again and walks 55 metres. Finally, he turns to the right and moves 40 metres. In which direction is he now from his starting point?

A. South-west B. South C. North-west

D. South-east E. None of these

4.Deepa moved a distance of 75 metres towards the north. She then turned to the left and walking for about 25 metres, turned left again and walked 80 metres. Finally, she turned to the right at an angle of 45°. In which direction was she moving finally?

A. North-east B. North-west C. South

D. South-east E. South-west

5.Point A is 30 m to the east of point B. Point C is 10 m to the south of point A. Point D is 15 m to the west of point C. Point E is exactly in the middle of the points D and F. Points D, E and F lie in a straight line. The length of the DEF is 20 m. Point F is to the north of point D. Point G is 15 m to the east of Point F. How far and in which direction is point G from point A?

A. 10 m, South B. 15 m, North C. 10 m, North

D. 10 m, East E. None of these

6.Salman started walking from point A. He walked 6 m towards East to reach point B. From point B he took a right turn and walked 3 m to reach point C. From point C he took a right turn and walked 10 m to reach point D. From point D he took a left turn and walked 4 m to reach E. From point E, he walked 4 m East to reach point F. Point G is exactly mid-way between C and point D.

If Salman walks 4 m to the North of point F, how far and in which direction will he be from point G?

A. 1 m towards East B. 2 m towards East C. 1 m towards West

D. 2 m towards West E. 1.5 m towards East

7.Salman started walking from point A. He walked 6 m towards East to reach point B. From point B he took a right turn and walked 3 m to reach point C. From point C he took a right turn and walked 10 m to reach point D. From point D he took a left turn and walked 4 m to reach E. From point E, he walked 4 m East to reach point F. Point G is exactly mid-way between C and point D.

How far and in which direction is point F from point A?

A. 7 m towards South B. 6 m towards South C. 8 m towards South

D. 6 m towards North E. None of these

8.Point F is 10 m to the South of E. Point G is 3 m to the East of F. Point H is 5 m to the South of G. Point I is 6 m to the West of H. Point J is 10 m to the North of I. Point K is 6 m to the East of J. Point L is 5 m to the North of K.

Which of the following represents the direction of point G with respect to point J?

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

9.Point F is 10 m to the South of E. Point G is 3 m to the East of F. Point H is 5 m to the South of G. Point I is 6 m to the West of H. Point J is 10 m to the North of I. Point K is 6 m to the East of J. Point L is 5 m to the North of K.

How far and in which direction is point E from point L?

A. 6 m South B. 3 m East C. √234 m North

D. 3 m West E. 3 m North-East

10. Point R is 10 m North of point A. Point K is exactly in the middle of the points R and A. Point N is 7 m East of point A. Point M is 7 m East of point K. Point S is 6 m North of point M. What is the distance between points S and N?

A. 13 m B. 16 m C. 11 m

D. 12 m E. None of these

11. Town D is towards East of town F. Town B is towards North of town D. Town H is towards South of town B. Towards which direction is town H from town F?

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

D. Data inadequate E. None of these

12. A school bus driver starts from the school, drives 2 km towards North, takes a left turn and drives for 5 km. He then takes a left turn and drives for 8 km before taking a left turn again and driving for further 5 km. The driver finally takes a left turn and drives 1 km before stopping. How far and towards which direction should the driver drive to reach the school again?

A. 3 km towards North B. 7 km towards East C. 6 km towards South

D. 6 km towards West E. 5 km towards North

Correct Answers:

1	2	3	4	5	6	7	8	9	10	11	12
D	B	D	E	C	A	C	A	D	C	D	E

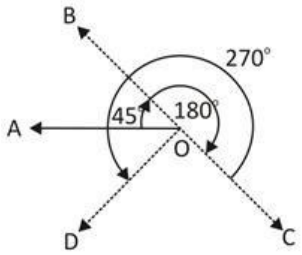
EXPLANATIONS

1.

Shortcut Approach:

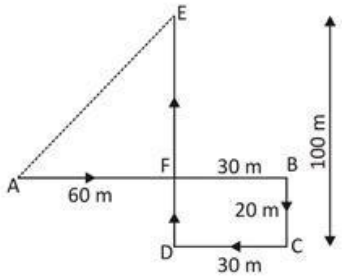
Total movement in Clockwise direction = 45 + 180 = 225 degrees
Total movement in Anti-clockwise direction = 270 degrees
The difference = 270 - 225 = 45 degrees (towards anti-clockwise because the total Degrees in anti-clockwise is more than that of clockwise direction)
So, 45 degrees in an anti-clockwise direction from the West will be South-West. Option D is hence the correct answer.

Traditional Method:



Clearly the man initially faces in the direction OA. On the moving 45 Degree clock wise, he faces in the direction OB . on further moving 180 degree clockwise, he faces in the direction OC. Finally, on moving 270 degree anti-clockwise, he faces in the direction OD, which is south-west. Hence, option D is correct.

2.



Clearly, the child moves from A 90 m east-wards up to B, then turns right and moves 20 m up to C, then turns right and moves 30 m up to D. Finally , he turns right and moves 100 m up to E.

Clearly, AB = 90m , BF = CD = 30 m SO, AF = AB – BF = 60 m. Also, DE = 100 m, DF = BC = 20 m So, EF = DE – DF = 80 m.

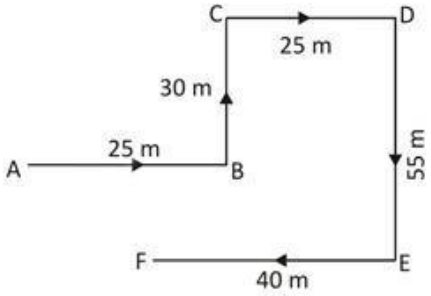
$$\text{So, his ditance from starting point A} = \text{AE} = (\sqrt{\text{AF}^2 + \text{EF}^2})$$

$$\sqrt{(60)^2 + (80)^2} = (\sqrt{3600 + 6400})$$

$$\sqrt{10000} = 100 \text{ M.}$$

Hence, option B is correct.

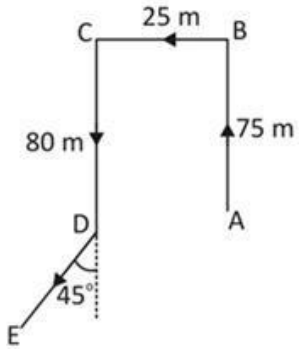
3.



Kailash turns right from north direction. So, hr walks 25 m towards east up to B, turns left and moves 30 m up to C, turns right and goes south and walks 55 m up to E. Next, he again turns to right and walks 40 m up to F, which is his final position. F is to the south–east of A. So , he is to the south-east from his starting point .

Hence, option D is correct.

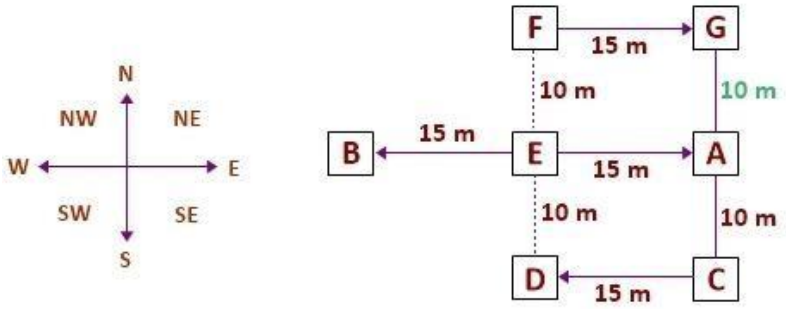
4.



Deepa started from A, Moved 75 m up to B, turned left and walked 25 m up to C. She turned left again and moved 80 m C to D. Turning to the right at angle of 45° , she was finally moving in the direction DE i.e, South- west.

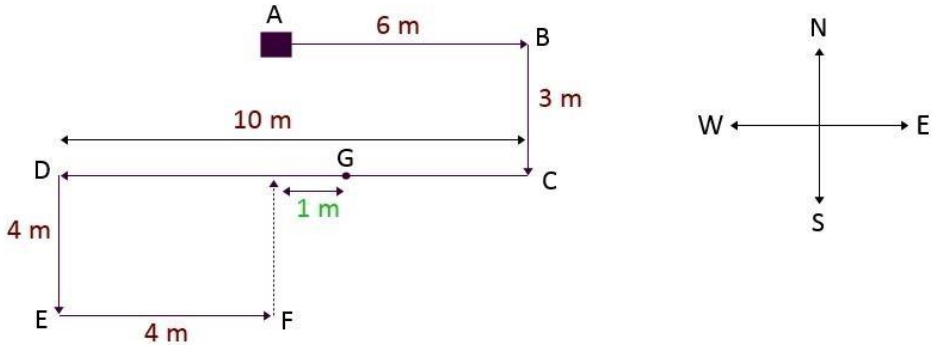
Hence, option E is correct.

5.



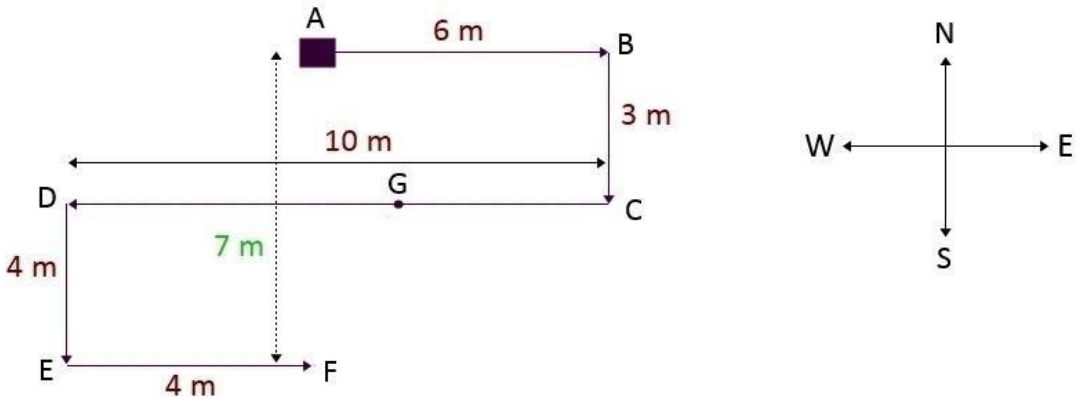
It's clear from the diagram that point G is 10 m to the north of point A.
Hence, option C is correct.

6.



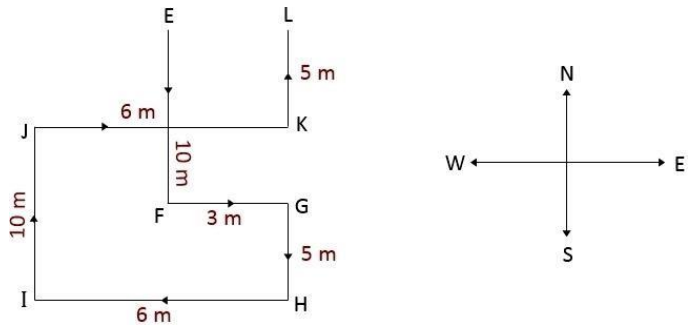
It's clear from the diagram that Salman's end point will be 1 m far from and in the west direction with respect to point G.
Hence, option A is correct.

7.



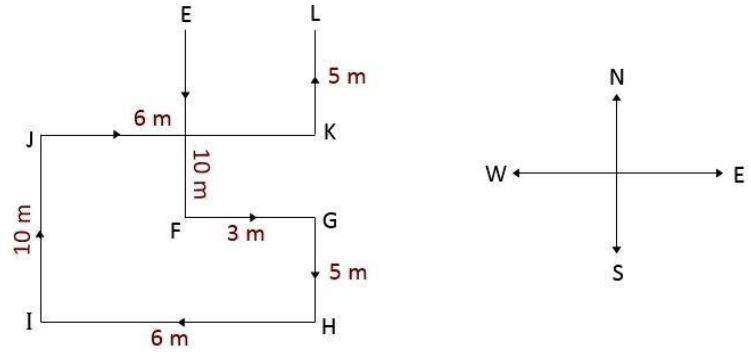
It's clear from the diagram that the point F is 7 m far from and in the south direction with respect to point A.
Hence, option C is correct.

8.



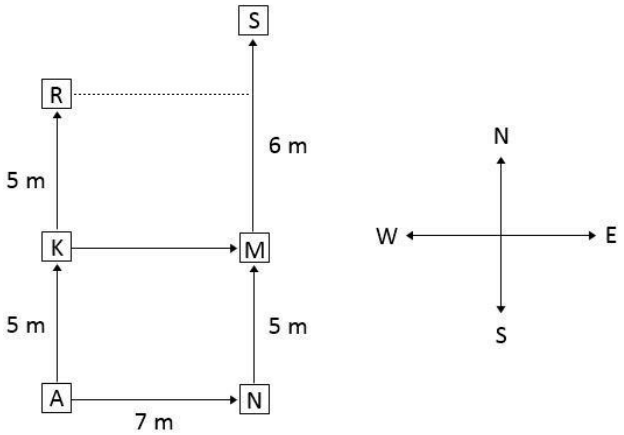
It's clear from the diagram that direction of point G with respect to point J is South- East.
Hence, option A is correct.

9.



It's clear from the diagram that the point E is 3 m far from and in the west direction with respect to point L.
Hence, option D is correct.

10.



It's clear from the diagram that the distance between S and N is (6 + 5) = 11 m
Hence, option C is correct.