

How to use this sheet. Plot every journey on the grids provided. Keep two running totals — one for east and west, one for north and south — and look for legs that cancel. Remember that the distance walked is not the same as the distance between the start and the finish. Target time is 45 seconds per question.

Turn reference — clockwise order is North, East, South, West. A right turn steps forward; a left turn steps back. Two turns the same way give the opposite direction. **Triples:** 3-4-5 5-12-13 8-15-17 7-24-25 9-40-41

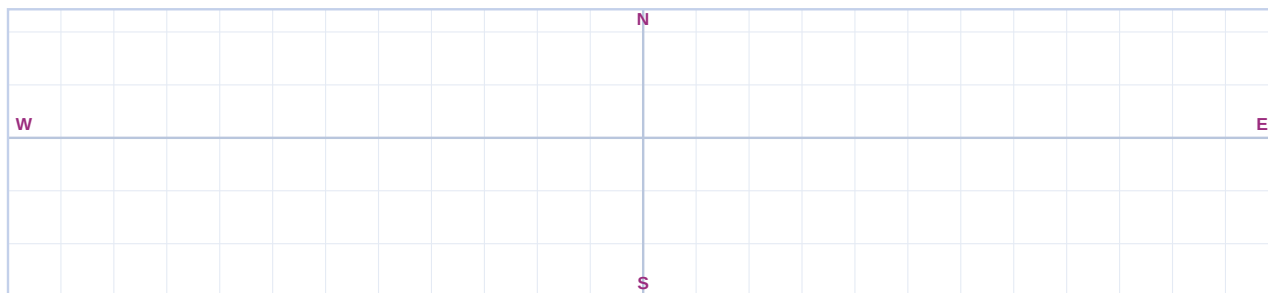
Section A · Multiple choice questions

Question 6 appeared in a real AAI ATC Junior Executive paper.

1. A man faces north. He turns right, then turns right again. Which direction is he facing?
(1) East (2) West (3) South (4) North
2. A man faces south. He turns 90 degrees clockwise, then turns 180 degrees. Which direction is he facing?
(1) West (2) East (3) North (4) South
3. Starting to face east, a person turns left three times. Which direction is she facing?
(1) East (2) North (3) West (4) South
4. A car starts moving north. It turns right, then left, then right, then left. In which direction is it finally moving?
(1) North (2) East (3) South (4) West

Compass working — Questions 1 to 4

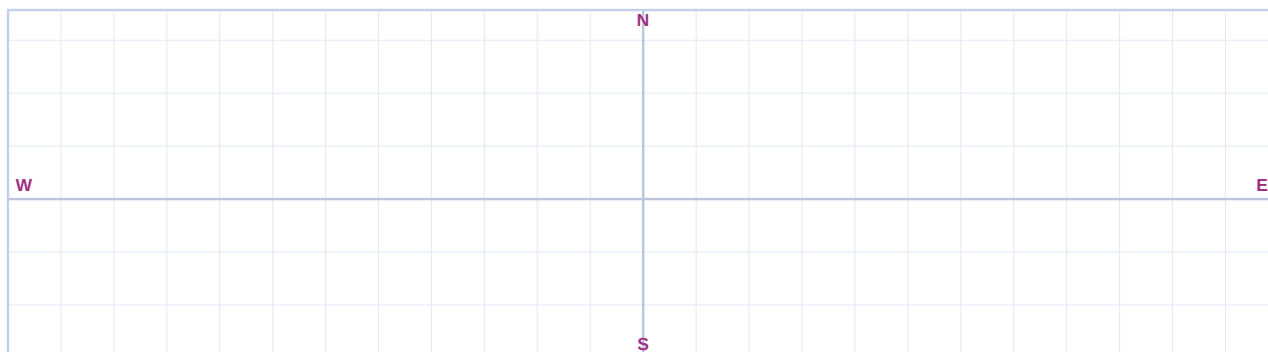
Mark each turn on the compass rather than counting in your head.



5. A man walks 5 km north, then turns around and walks 5 km south. How far is he from his starting point?
(1) 0 km (2) 5 km (3) 10 km (4) Cannot be determined
6. Arjun travels 10 km from a cafeteria towards the north. He turns left and walks 6 km. Then he turns right and walks 4 km. Finally he turns right and walks 6 km to reach the railway station. What is the distance between the cafeteria and the railway station? **[PYQ 2021 · Shift 2]**
(1) 20 km (2) 14 km (3) 16 km (4) 26 km
7. A person walks 8 km east, then 6 km north, then 8 km west, then 6 km north. How far is she from her start?
(1) 6 km (2) 10 km (3) 12 km (4) 14 km
8. P walks 2 km north, then 3 km east, then 4 km south, then 3 km west. Where is he relative to his start?
(1) 2 km north (2) 3 km east (3) At the starting point (4) 2 km south

Journey grid — Questions 5 to 8

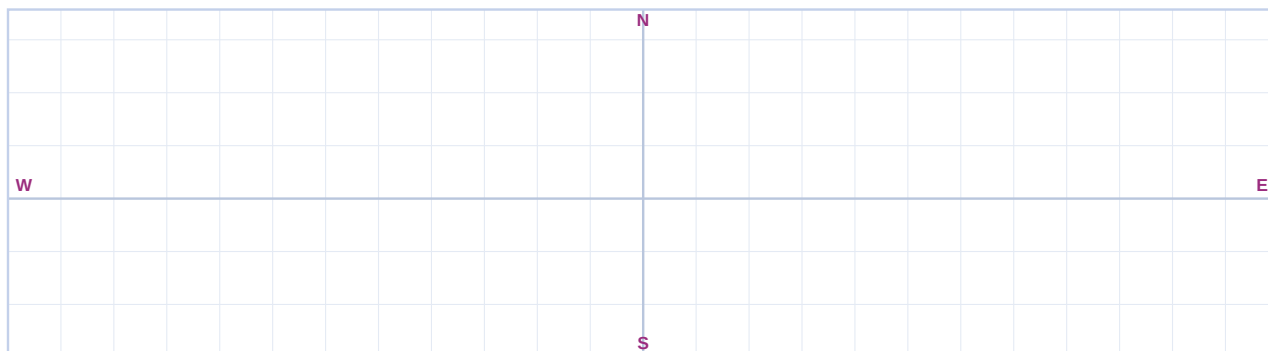
Plot each leg. Circle any pair of legs that cancel.



9. A man walks 3 km east and then 4 km north. What is the shortest distance from his starting point?
(1) 7 km (2) 5 km (3) 6 km (4) 1 km
10. A car travels 12 km south, then turns and travels 5 km west. What is the shortest distance from the start?
(1) 7 km (2) 17 km (3) 15 km (4) 13 km
11. A cyclist rides 15 km north then 8 km east. What is the shortest distance from the starting point?
(1) 23 km (2) 17 km (3) 19 km (4) 21 km
12. A person walks 5 km north, turns right and walks 3 km, turns right and walks 9 km, then turns right and walks 3 km. Where is he relative to the start?
(1) 4 km south (2) 4 km north (3) 6 km south (4) 14 km south

Journey grid — Questions 9 to 12

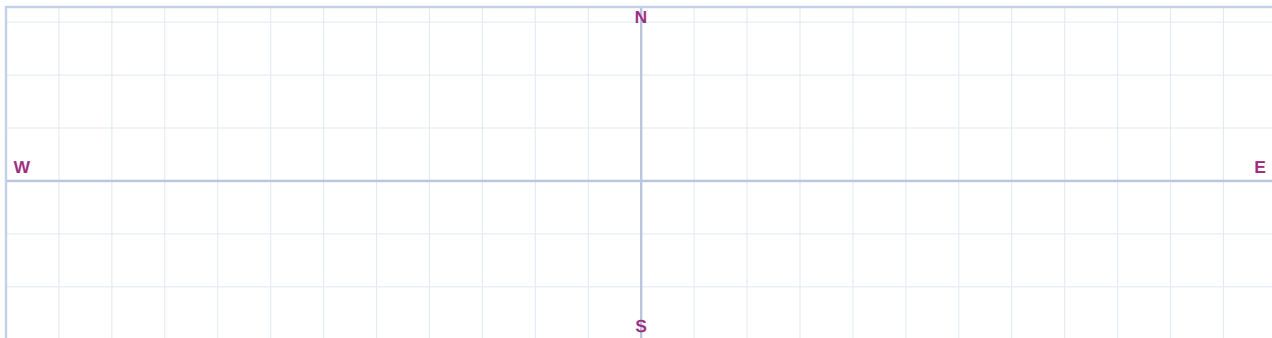
Two totals, then Pythagoras. Expect a whole-number answer.



13. Early in the morning, a man's shadow falls exactly to his left. Which direction is he facing?
(1) North (2) South (3) East (4) West
14. In the evening, a woman's shadow falls exactly to her right. Which direction is she facing?
(1) North (2) South (3) East (4) West
15. In the morning Ravi walks straight towards the sun. After a while he turns left, and shortly afterwards turns right. In which direction is he now moving?
(1) North (2) West (3) East (4) South
16. A man facing north turns 45 degrees clockwise, then a further 45 degrees clockwise. Which direction is he facing?
(1) North-east (2) East (3) South-east (4) South
17. A man walks 4 km west, 3 km north, 4 km east and 3 km north. How far is he from his starting point?
(1) 3 km (2) 6 km (3) 8 km (4) 14 km
18. Two friends start from the same point. A walks 6 km north, B walks 8 km east. How far apart are they?
(1) 14 km (2) 12 km (3) 10 km (4) 2 km

Working space — Questions 13 to 18

For shadow questions, mark the sun first and the shadow directly opposite.



Section B · Assertion and reason

For each pair mark (a) both true and the reason explains the assertion, (b) both true but the reason does not explain it, (c) the assertion is true and the reason false, (d) the assertion is false and the reason true.

19. Assertion: A left turn followed immediately by a right turn leaves the facing direction unchanged.

Reason: The two turns move you one step back and then one step forward around the compass.

20. Assertion: The distance between the start and the finish equals the total distance walked.

Reason: Every leg of a journey adds to the separation between the two points.

21. Assertion: In the 2021 paper the answer was 14 km rather than 26 km.

Reason: The 6 km westward leg and the 6 km eastward leg cancelled each other exactly.

22. Assertion: A morning shadow points towards the west.

Reason: A shadow always falls on the side away from the sun, and the morning sun is in the east.

23. Assertion: The final facing direction can be worked out from the distances walked.

Reason: Facing direction depends only on the turns taken, not on how far each leg runs.

24. Assertion: If the two running totals are 5 and 12, the shortest distance is 13.

Reason: 5, 12 and 13 form a Pythagorean triple, so the hypotenuse is a whole number.

25. Assertion: Two right turns in succession leave a person facing the opposite direction.

Reason: Each right turn moves one step clockwise, and two steps clockwise is half the compass.

26. Assertion: An ugly square root in a direction answer usually means the arithmetic is correct.

Reason: Exam setters choose distances from standard Pythagorean triples so answers come out whole.

Stuck on any of these? Bring them to a live class.

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