5. Directions

🧭 **Types of Direction Questions:**

1. **Simple direction-based movement**
2. **Finding distance**
3. **Identifying final direction**
4. **Combining multiple directions**
5. **Shadow-based direction (sometimes)**

▨ **Key Directions:**

Direction	Opposite Direction
North	South
East	West
North-East	South-West
North-West	South-East

☑ **Formulas to Remember:**

- When a person turns **right**, the direction changes clockwise.
- When a person turns **left**, the direction changes anticlockwise.
- Use the **Pythagoras theorem** if final distance needs to be calculated diagonally.

☑ **Example 1: Simple Direction**

Q: Ramesh walks 5 km north, then turns right and walks 3 km. In which direction is he now?

➡ **Solution:**

- Starts facing **North**
- Turns **right** → Now facing **East**
- So, **Answer: East**

☑ **Example 2: Final Position (Distance + Direction)**

Q: A person walks 4 km North, then 3 km East. What is the shortest distance from the starting point and in which direction?

➡️ **Solution:**

- Movement forms a right triangle.
- Distance = $\sqrt{(4^2 + 3^2)}$ = $\sqrt{(16+9)}$ = $\sqrt{25}$ = **5 km**
- Final direction = **North-East**

☑️ **Example 3: Facing Direction**

Q: A man is facing East. He turns left, then right, then again right. Which direction is he facing now?

➡️ **Solution:**

- Facing East
- Left → North
- Right → East
- Right → South
  Answer: South

☑️ **Example 4: Opposite Direction**

Q: A person walks 5 km South, turns left, walks 3 km, then turns left again and walks 5 km. In which direction is he from the starting point?

➡️ **Solution:**

- Walks 5 km South
- Turns left → East → 3 km
- Turns left → North → 5 km
  → Back to same latitude, 3 km to the East of starting point
  Answer: East

📝 **Tips to Solve Direction Questions:**

- Always draw a **rough diagram**.
- Mark **N, S, E, W** on corners.
- Use a **pencil/pen and paper** for tracking.
- Carefully track **left/right** turns based on current facing.