

Problem Type	Typical Question	Required Output
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Introduction to Land Survey Problem Solving

Boundary closure	"Do the measured sides of a parcel close within tolerance?"	Misclosure distance, angular misclosure, adjusted coordinates
Stakeout	"Locate a new building corner 150?m at a bearing of 62° from a known point."	XYZ coordinates of the stake point
Leveling	"Determine the elevation of a benchmark 250?m away."	Reduced level of the benchmark
Area/Volume calculation	"Compute the area of an irregular lot."	Area (m ²) and, if needed, volume (m ³)
Coordinate transformation	"Convert local grid coordinates to UTM."	Transformed (Easting, Northing) values
Error analysis	"Assess the impact of instrument error on distance measurement."	Propagated standard deviation, confidence interval

4. General Solution Workflow

1. Define the Problem

- Identify known data (distances, angles, coordinates).
- Clarify required results (coordinates, area, closure, etc.).

2. Choose the Appropriate Method

- **Traverse** for boundary problems.
- **Intersection/Intersection** for stakeout.
- **Rising & setting** for leveling.
- **Coordinate geometry** (trigonometric formulas) for simple calculations.

3. Set Up a Working Coordinate System

- Use a convenient origin (often a known point).
- Adopt a consistent azimuth convention (e.g., clockwise from north).

4. Perform Calculations

- Convert polar to Cartesian:
[$X = X_0 + D\cos\theta$, $Y = Y_0 + D\sin\theta$]

Introduction to Land Survey Problem Solving

- Apply the **Law of Sines** or **Law of Cosines** for triangulation.
- Use **least squares adjustment** for traverses with redundant observations.

5. Check Results

- Compute misclosures (distance, angle, area).