

# Traverse Survey

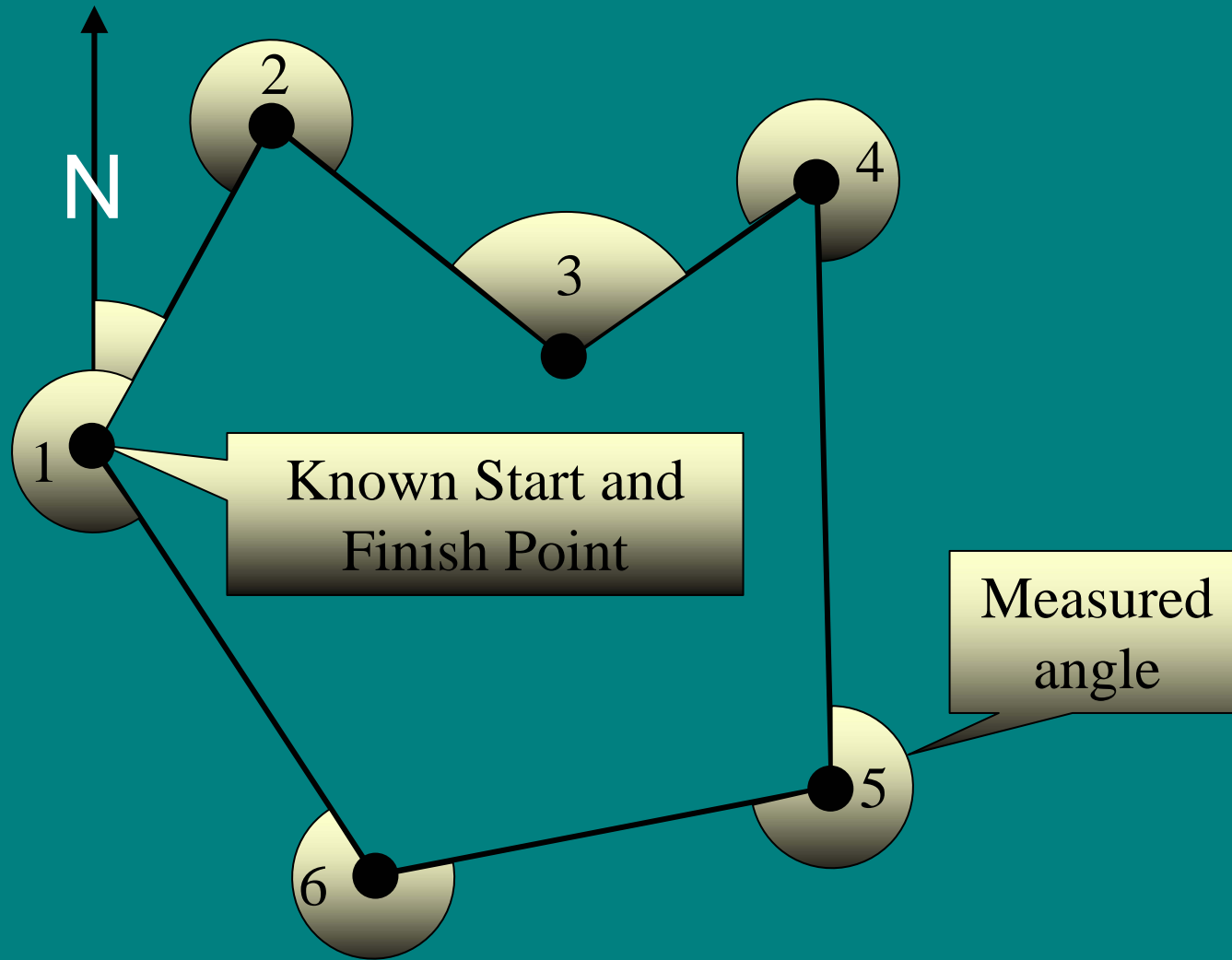


A series of intervisible points  
at which angles are  
measured,  
And between which  
distances are measured

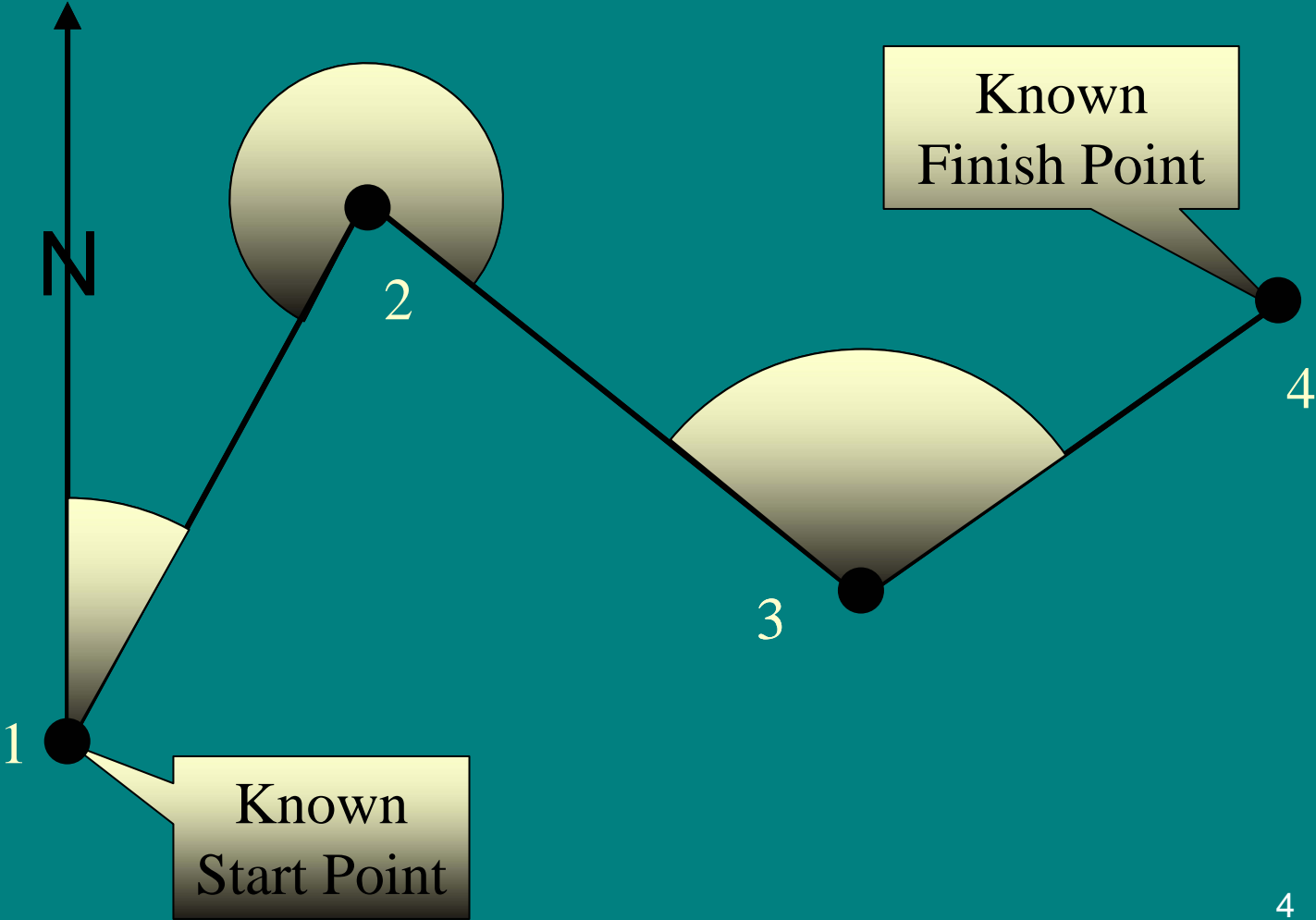
# Traverse Types

1. A closed polygonal traverse starts and finishes on the same known point.
2. A closed link traverse joins two known points.
3. An open traverse starts on a known point and finishes on an unknown point.

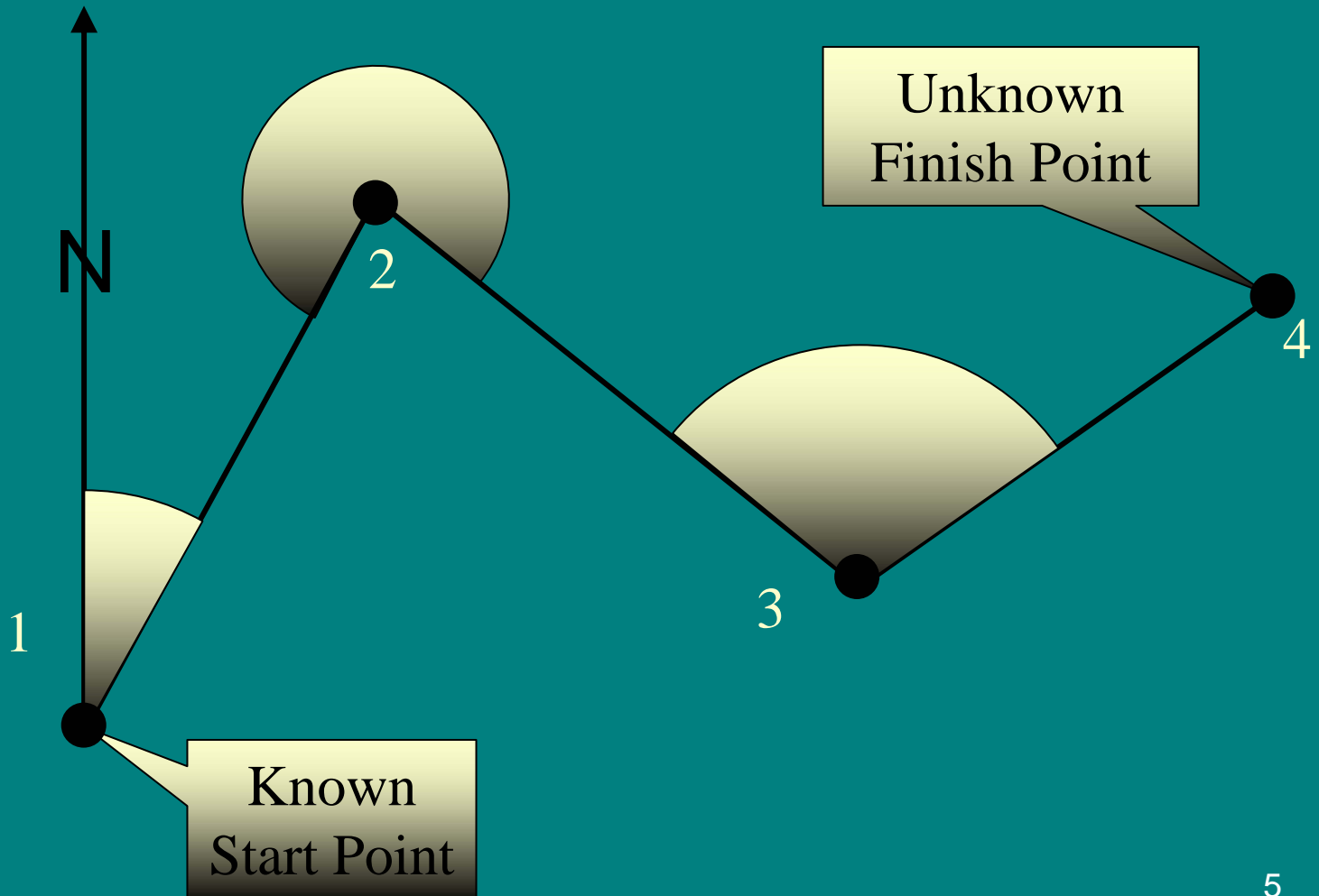
# Closed Polygonal Traverse



# Link Traverse

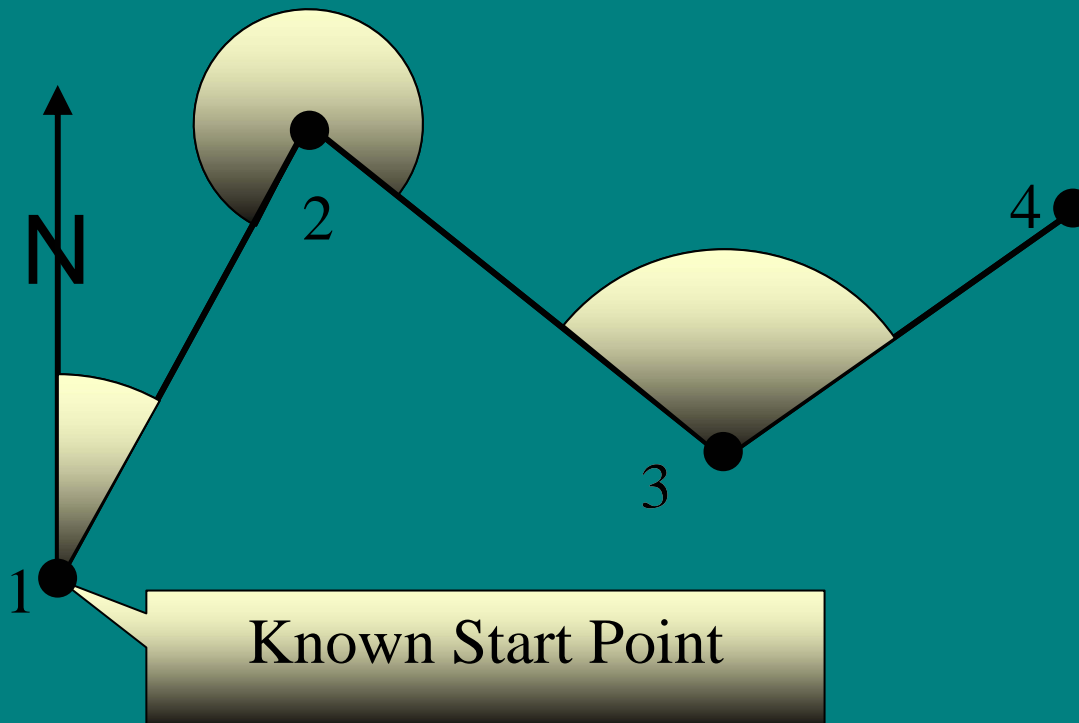


# Open Traverse



# Coordinate Calculation

- The start coordinates must be known
- The start orientation must be known



# Total Station Traversing

- A Total Station can calculate coordinates and WCB's on the fly
- The method eliminates calculation, but the instrument must be checked for adjustment at the start of the survey

# Closing Errors

If the traverse misclosure is greater than is desirable, there are two choices: -

1. Adjust the survey
2. Repeat the survey

# Adjustment

- There are various methods used to adjust surveys
- No method will improve the accuracy of the observations but only the consistency of the geometry
- Adjustment can generate a false confidence in the quality of a survey

# Repeat the Survey

This is the recommended choice as no amount of statistical manipulation can improve poor observations

# THE END



### Slide 1

- This procedure is used to extend survey control beyond existing known points.

### Slide 2

- The open traverse is a dangerous activity that should be avoided if at all possible as errors are hidden.

### Slide 3

- A closed traverse that starts and finishes on the same known point forms a polygon.
- If the polygon has  $n$  sides, then  $n$  sides and  $n$  angles are measured.
- The sum of the internal angles is  $2(n-4)$  right angles.
- The sum of the external angles is  $2(n+4)$  right angles.
- This is a quick and definitive check on the accuracy of the angles that have been measured.
- To check the distances it is necessary to calculate coordinates of all points on the traverse.
- Obviously the calculated coordinates of the finish point should be same as the start coordinates plus or minus an acceptable tolerance.
- The orientation at point 1 must also be known.

### Slide 4

- The calculated coordinates of the finish point should be same as the known coordinates of the finish plus or minus an acceptable tolerance.

### Slide 5

- Mistakes in calculation or observation are not detectable in this type of traverse.
- Think very carefully before you use this method.

### Slide 6

- Whole circle bearing, (WCB), of 1 to 2 must be known.
- $WCB(2 \text{ to } 3) = WCB(1 \text{ to } 2) - 180 \text{ degrees} + \text{clockwise angle at } 2.$
- $WCB(3 \text{ to } 4) = WCB(2 \text{ to } 3) - 180 \text{ degrees} + \text{clockwise angle at } 3.$
- Etc. etc.
- $X(2) = X(1) + \text{distance}(1 \text{ to } 2) * \sin(WCB(1 \text{ to } 2))$
- $Y(2) = Y(1) + \text{distance}(1 \text{ to } 2) * \cos(WCB(1 \text{ to } 2))$
- Etc. etc.

### Slide 10

- It is a good idea to repeat the survey anyway in order to eliminate the, (admittedly unlikely), possibility of compensating errors.