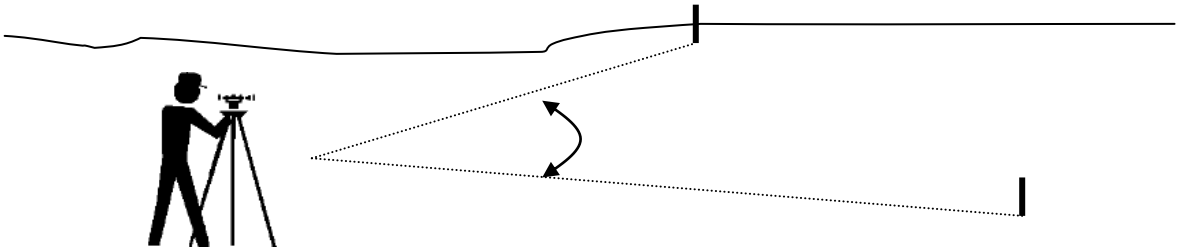
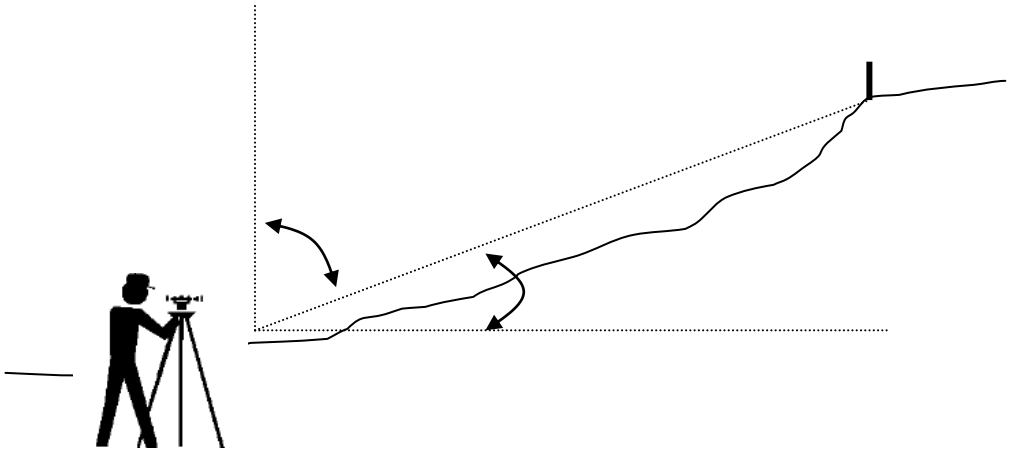
Lecture 5 – Angles, Bearings, and Azimuths

Introduction

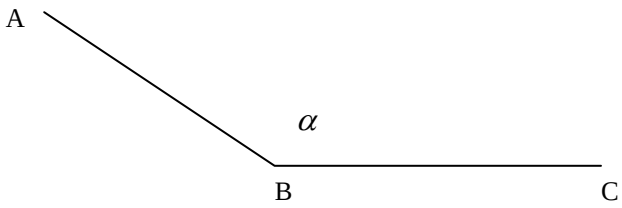
- Location of a line is done with angles and direction
- Two types of angles

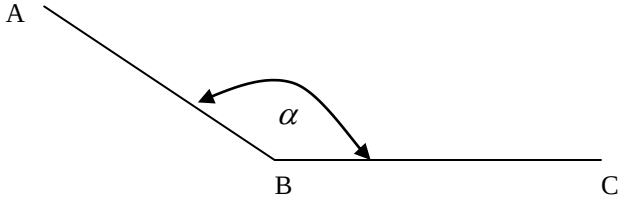


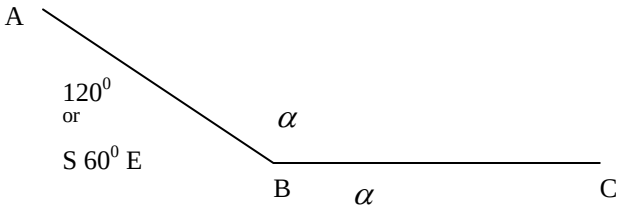


Three requirements for turning an angle:

Example:

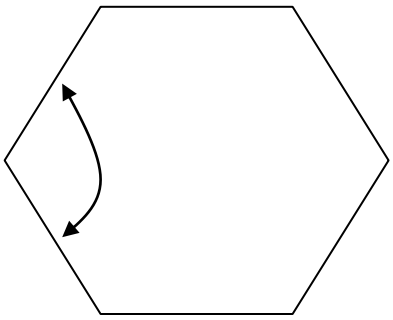




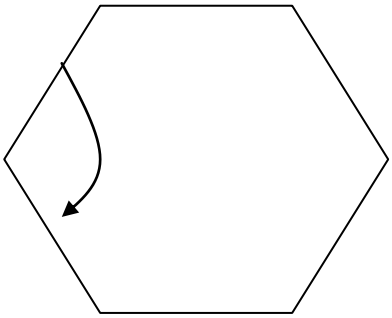


Angle Types

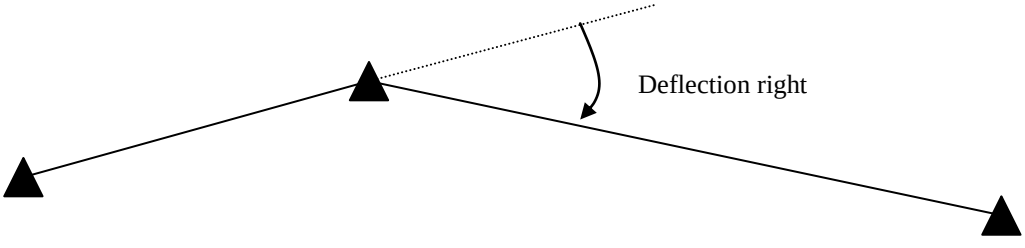
- Interior angles



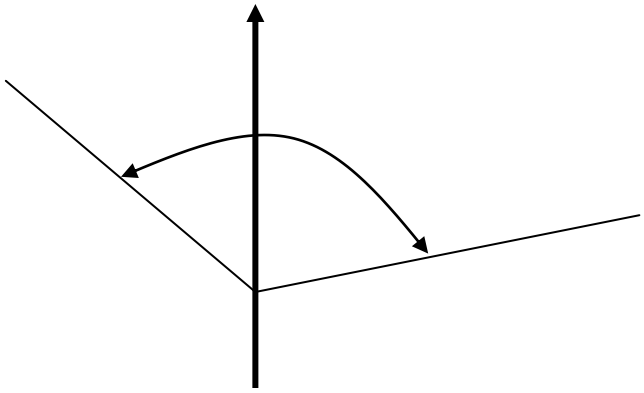
- Angles to the right



- Deflection Angles



Directions of lines



Two types of directions:

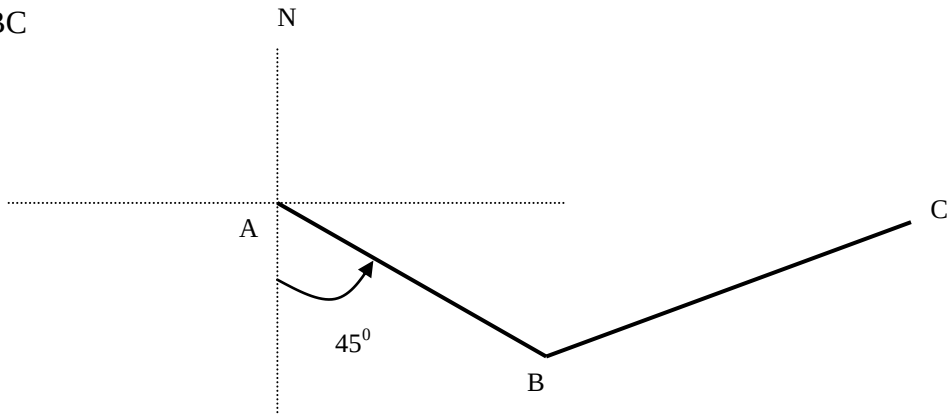
Bearings

Bearings are expressed by quadrant with respect to the reference line.

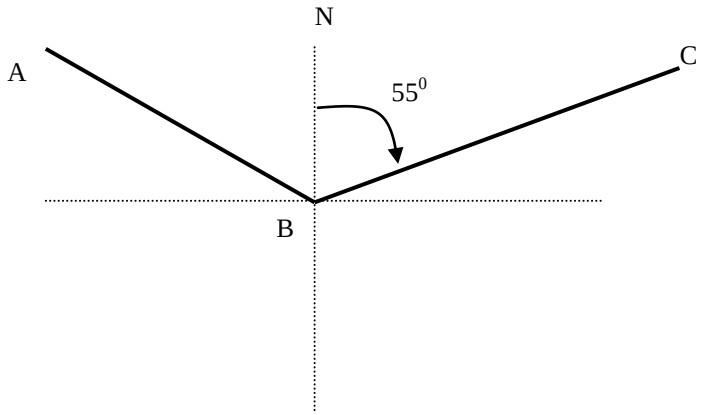
- Measured as the acute angle between the reference line and the line itself
- Measured either north or south
- Referenced additionally to the east or west
- Referenced to the direction of the survey

Example: Traverse ABC

Line AB – Bearing =



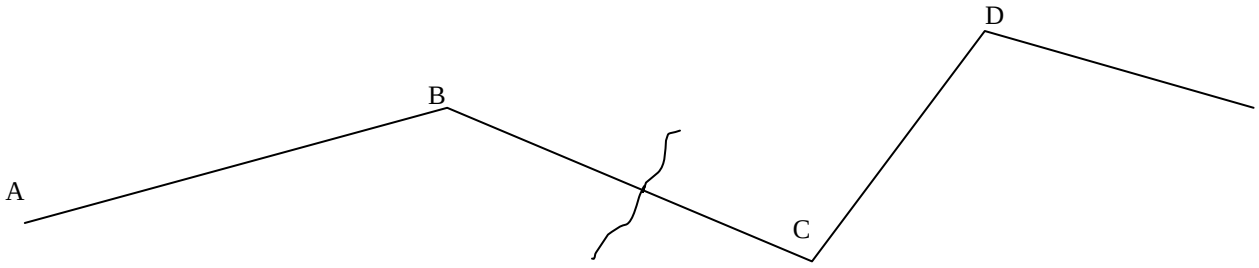
Line BC – Bearing =



Field process

Bearings are measured ***ahead*** or ***forward*** and then checked ***back***.

Sta	HD	Brg AHD	Brg BCK	Notes
A				
	121.85	N 62 E	S 61 W	
B				
	89.63	S 70 E	N 70 W	Creek
C				
	82.61	N 27 E	S 28 W	
D				



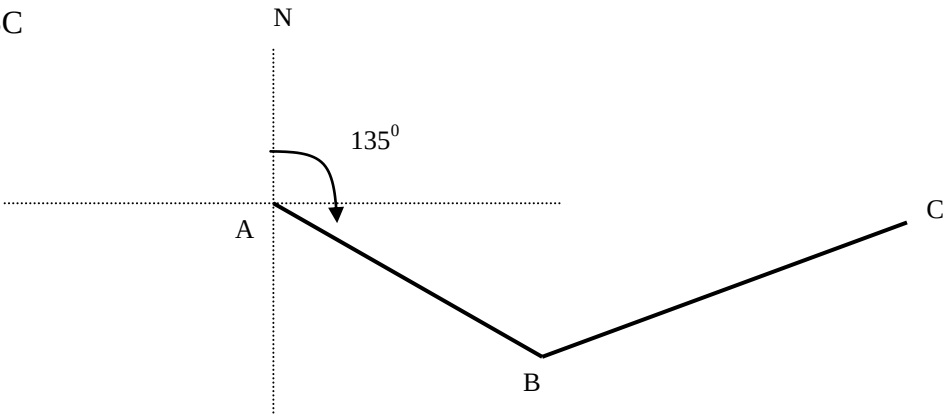
Azimuths

Azimuths are expressed clockwise with reference to the reference line.

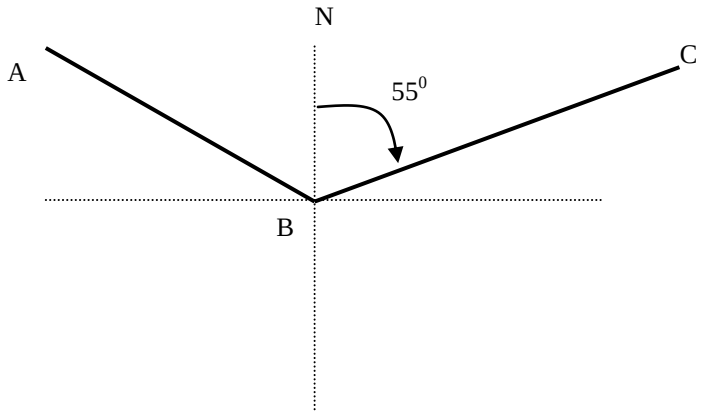
- Measured as the total angle between the reference line and the line itself clockwise
- Generally measured from north
- No referencing from the east or west

Example: Traverse ABC

Line AB – Azimuth =



Line BC – Azimuth =

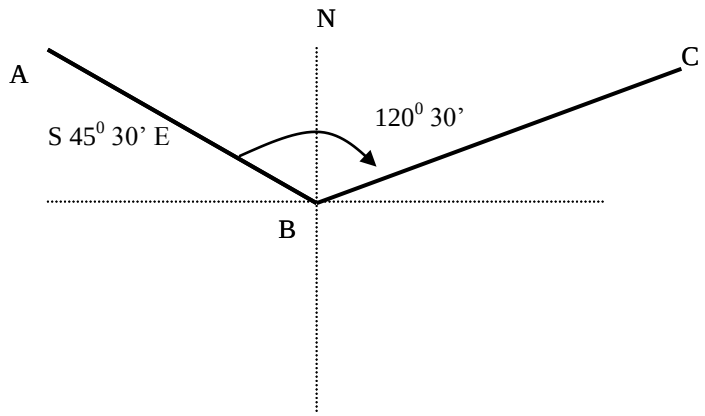


Computing Bearings

It is quite often necessary to compute bearings from angles

Again, the three requirements for turning an angle:

Example problem: Line AB has been set at S 45^0 30’ E. Angle B was turned 120^0 30’. What is the bearing of BC?



Computing Azimuths

Example problem: Line AB has been set at 134^0 30'. Angle B was turned 120^0 30'. What is the azimuth of BC?