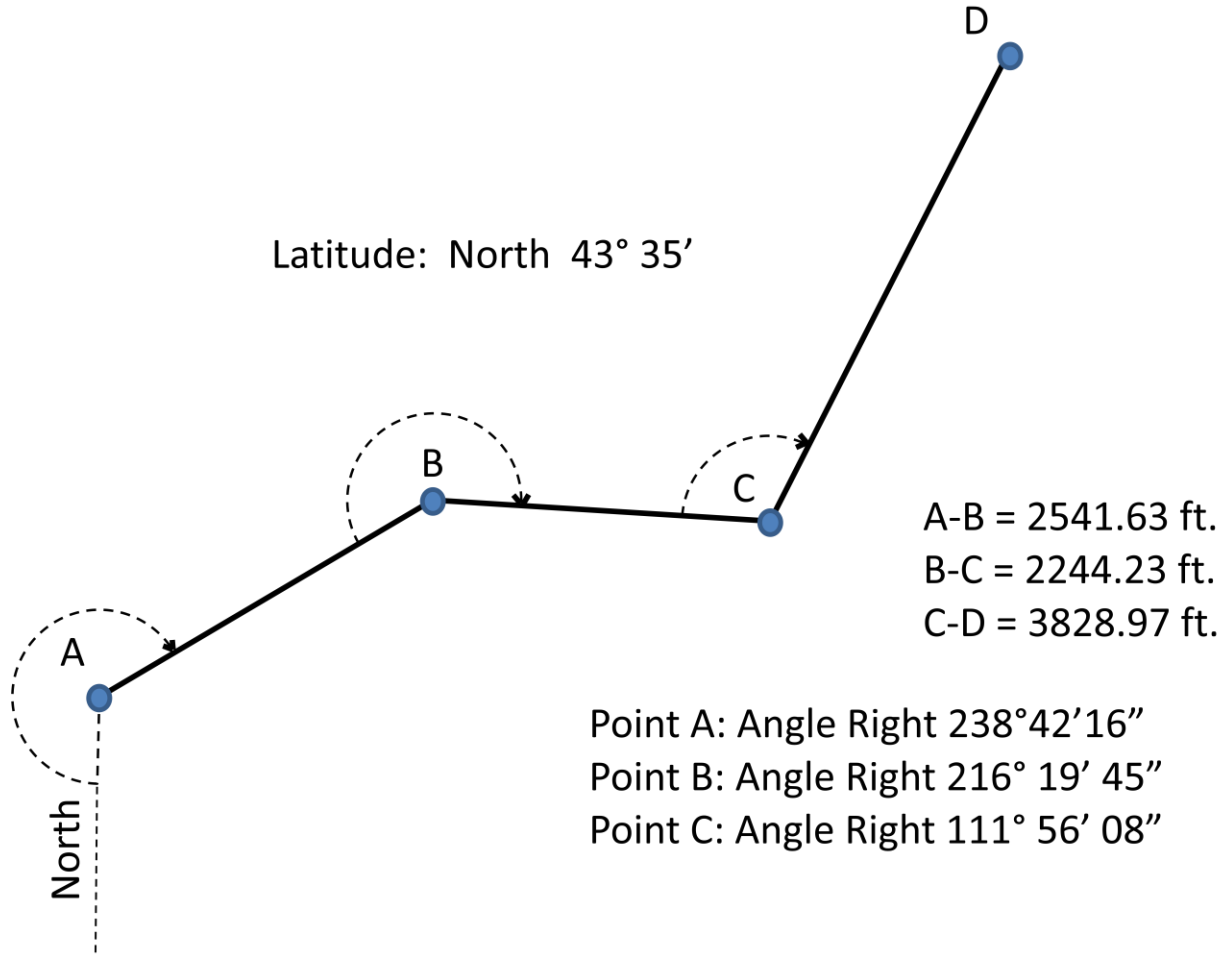


Exercise #4

Calculate the Mean Bearing of Each Line



Calculate Forward Bearing at A:

- $238^{\circ} 42' 16'' - 180^{\circ} 00' 00'' = \underline{\text{N. } 58^{\circ} 42' 16'' \text{ E.}}$

Calculate Departure of Line A-B:

- $\sin 58^{\circ} 42' 16'' (\text{forward bearing}) \times 2541.63 (\text{distance A-B}) = \underline{\text{2171.82 ft.}}$

Calculate Back Bearing at B:

- Convergency of meridians 6 miles apart at N. $43^{\circ} 35'$ lat. = $0^{\circ} 04' 57''$ (from table 11)
- $0^{\circ} 04' 57'' \div 31,680.00 \text{ ft. (6 miles in ft.)} = 0.000003^{\circ}$ (curvature per ft. of departure)
- $0.000003^{\circ} \times 2171.82 \text{ ft. (departure of line A-B)} = 0.005656^{\circ} = 0^{\circ} 00' 20''$
- $\text{N. } 58^{\circ} 42' 16'' \text{ E.} + 0^{\circ} 00' 20'' = \underline{\text{S. } 58^{\circ} 42' 36'' \text{ W.}}$ (reverse the quadrant because it is a back bearing)

Remember: If your line is an easterly line apply the correction clockwise.
If your line is a westerly line apply the correction counter-clockwise.

Calculate Mean Bearing of Line A-B:

- $\frac{58^{\circ} 42' 16'' \text{ (forward bearing at A)} + 58^{\circ} 42' 36'' \text{ (back bearing at B)}}{2} = \underline{\underline{\text{N. } 58^{\circ} 42' 26'' \text{ W.}}}$
-

Calculate the Forward Bearing at B:

- $S. 58^{\circ} 42' 36'' \text{ E. (back bearing B-A)} + 216^{\circ} 19' 45'' \text{ (angle right @ B)} = 275^{\circ} 02' 21''$
- $360^{\circ} 00' 00'' - 275^{\circ} 02' 21'' = \underline{\underline{\text{S. } 84^{\circ} 57' 39'' \text{ E}}}$

Calculate Departure of Line B-C:

- $\sin 84^{\circ} 57' 39'' \text{ (forward bearing)} \times 2244.23 \text{ ft. (distance B-C)} = \underline{\underline{\text{2235.56 ft.}}}$

Calculate Back Bearing at C:

- $0.000003^{\circ} \text{ (curvature per ft. of departure)} \times 2235.56 \text{ ft. (departure of line B-C)} = 0.005822^{\circ} = 0^{\circ} 00' 21''$
- $S. 84^{\circ} 57' 39'' \text{ E.} - 0^{\circ} 00' 21'' = \underline{\underline{\text{N. } 84^{\circ} 57' 18'' \text{ W.}}}$

Calculate Mean Bearing of Line B-C:

- $\frac{84^{\circ} 57' 39'' \text{ (forward bearing at B)} + 84^{\circ} 57' 18'' \text{ (back bearing at C)}}{2} = \underline{\underline{\text{S. } 84^{\circ} 57' 29'' \text{ E.}}}$
-

Calculate the Forward Bearing at C:

- $N. 84^{\circ} 57' 18'' \text{ W. (back bearing)} - 111^{\circ} 56' 08'' \text{ (angle right)} = \underline{\underline{\text{N. } 26^{\circ} 58' 50'' \text{ E.}}}$

Calculate Departure of Line C-D:

- $\sin 26^{\circ} 58' 50'' \text{ (forward bearing)} \times 3828.97 \text{ ft. (distance C-D)} = \underline{\underline{\text{1737.16 ft.}}}$

Calculate Back Bearing at D:

- $0.000003^{\circ} \text{ (curvature per ft. of departure)} \times 1737.16 \text{ ft. (departure of line C-D)} = 0.004524^{\circ} = 0^{\circ} 00' 16''$

- N. 26° 58' 50" E. + 0° 00' 16" = **S. 26° 59' 06" W.** (reverse the quadrant because it is a back bearing)

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Calculate Mean Bearing of Line C-D:

- $\frac{26^\circ 58' 50'' \text{ (forward bearing at C)} + 26^\circ 59' 06'' \text{ (back bearing at D)}}{2} = \mathbf{\underline{N. 26^\circ 58' 58'' E.}}$

