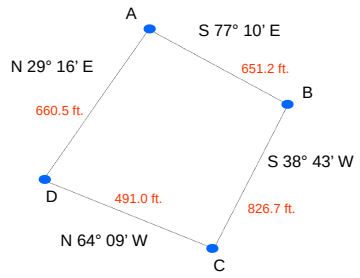
Surveying - Traverse

Group Example Problem 1



Surveying - Traverse

Group Example Problem 1

- Compute the latitudes, departures, $E_{closure}$, and the precision for the following traverse.

Side	Bearing	degree	minutes		Length (ft.)	Latitude	Departure
AB	S	77	10	E	651.2		
BC	S	38	43	W	826.7		
CD	N	64	9	W	491.0		
DA	N	29	16	E	660.5		

Latitude $_{AB}$ $-S = (651.2 \text{ ft.})\cos(77.1667^\circ) = -144.642 \text{ ft.}$

Departure $_{AB}$ $+E = (651.2 \text{ ft.})\sin(77.1667^\circ) = +634.933 \text{ ft.}$

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AB	S	77	10	E	651.2	-144.642	634.933
BC	S	38	43	W	826.7		
CD	N	64	9	W	491.0		
DA	N	29	16	E	660.5		

Latitude $_{BC}$ $-S = (826.7 \text{ ft.})\cos(38.7167^\circ) = -645.031 \text{ ft.}$

Departure $_{BC}$ $-W = (826.7 \text{ ft.})\sin(38.7167^\circ) = -517.076 \text{ ft.}$

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Side	Bearing	degree	minutes		Length (ft.)	Latitude	Departure
AB	S	77	10	E	651.2	-144.642	634.933
BC	S	38	43	W	826.7	-645.031	-517.076
CD	N	64	9	W	491.0		
DA	N	29	16	E	660.5		

Latitude $_{CD}$ $+N = (491.0 \text{ ft.})\cos(64.1500^\circ) = +214.084 \text{ ft.}$

Departure $_{CD}$ $-W = (491.0 \text{ ft.})\sin(64.1500^\circ) = -441.870 \text{ ft.}$

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AB	S	77	10	E	651.2	-144.642	634.933
BC	S	38	43	W	826.7	-645.031	-517.076
CD	N	64	9	W	491.0	214.084	-441.870
DA	N	29	16	E	660.5		

Latitude $_{DA}$ $+N = (660.5 \text{ ft.})\cos(29.2667^\circ) = +576.190 \text{ ft.}$

Departure $_{DA}$ $+E = (660.5 \text{ ft.})\sin(29.2667^\circ) = +322.902 \text{ ft.}$

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AB	S	77	10	E	651.2	-144.642	634.933
BC	S	38	43	W	826.7	-645.031	-517.076
CD	N	64	9	W	491.0	214.084	-441.870
DE	N	29	16	E	660.5	576.190	322.902

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$$E_{closure} = \sqrt{(E_L)^2 + (E_D)^2} = \sqrt{(0.601)^2 + (-1.110)^2} = 1.262 \text{ ft.}$$

Side	Bearing	degree	minutes		Length (ft.)	Latitude	Departure
AB	S	77	10	E	651.2	-144.642	634.933
BC	S	38	43	W	826.7	-645.031	-517.076
CD	N	64	9	W	491.0	214.084	-441.870
DA	N	29	16	E	660.5	576.190	322.902
					2629.4	0.601	-1.110

$$\text{Precision} = \frac{E_{closure}}{\text{perimeter}} = \frac{1.262 \text{ ft.}}{2{,}629.4 \text{ ft.}} = 4.800 \times 10^{-4} = \boxed{\frac{1}{2{,}083}}$$

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Group Example Problem 1

Questions?