Closed Traverse Angle Misclosure and Balancing

Angular misclosure of a closed traverse from the sum of its interior angles, the correction per angle and the allowable misclosure for the order of survey.

Method: Angular misclosure and balancing

Input parameters

Unit system: SI

Parameter	Value	Unit
Number of sides (angles)	5.0000	
Sum of observed interior angles	540.01	°
Allowable constant (arc seconds × √n)	15.000	

Calculated results

Parameter	Value	Unit
Correct sum	540.00	°
Misclosure (arc seconds)	25.000	
Correction per angle (arc seconds)	-5.0000	
Allowable misclosure (arc seconds)	33.541	
Ratio to allowable	0.74536	

Notes for this case

• Interior angles of a closed polygon sum to (n − 2)180°. The misclosure is spread equally over the angles (they were measured with equal care), rounding so the corrections sum exactly to the misclosure. Allowable misclosure is usually K√n, with K from the job specification or accuracy standard (for example 10–30″ for engineering traverses).

Formula and method

$$e = \Sigma\beta - (n-2)180^\circ, \quad c = -\frac{e}{n}, \quad e_{allow} = K\sqrt{n}$$

Variables

n	Number of sides (angles)	-
$\Sigma\beta$	Sum of observed interior angles	rad
K	Allowable constant (arc seconds × √n)	-
$(n-2)180^\circ$	Correct sum	rad
e	Misclosure (arc seconds)	-
c	Correction per angle (arc seconds)	-
$K\sqrt{n}$	Allowable misclosure (arc seconds)	-
	e	/K\sqrt n$

Method and standards

Angle balancing.

Assumptions and limits

- Equal weight angles; closed polygon.

References

Angular misclosure and balancing

Report details

Report reference	FCC-3ATF-KRPV (the same inputs always give the same reference)
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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/civil/surveying/traverse-angle-balancing

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.