

Important Traversing Formulas PDF



Formulas Examples with Units

List of 12 Important Traversing Formulas

1) Closing Error in Traversing Formula ↻

Formula

$$e = \sqrt{\sum L^2 + \sum D^2}$$

Example with Units

$$50\text{ m} = \sqrt{40\text{ m}^2 + 30\text{ m}^2}$$

Evaluate Formula ↻

2) Correction of Latitude by Transit Rule Formula ↻

Formula

$$c_{l/r} = e_{l/r} \cdot \frac{L}{\sum L}$$

Example with Units

$$24.5\text{ m} = 49\text{ m} \cdot \frac{20\text{ m}}{40\text{ m}}$$

Evaluate Formula ↻

3) Correction to First Bearing for given Closing Error Formula ↻

Formula

$$c_b = \left(\frac{e}{N_{\text{Sides}}} \right) \cdot \left(\frac{\pi}{180} \right)$$

Example with Units

$$25^\circ = \left(\frac{50\text{ m}}{2} \right) \cdot \left(\frac{3.1416}{180} \right)$$

Evaluate Formula ↻

4) Correction to Latitude by Bowditch Rule Formula ↻

Formula

$$c_{l/r} = e_{l/r} \cdot \frac{L}{P}$$

Example with Units

$$11.5294\text{ m} = 49\text{ m} \cdot \frac{20\text{ m}}{85\text{ m}}$$

Evaluate Formula ↻

5) Correction to Northing in Transit Rule Formula ↻

Formula

$$e = 0.5 \cdot e_{l/r} \cdot \frac{n}{\sum N}$$

Example with Units

$$51.0417\text{ m} = 0.5 \cdot 49\text{ m} \cdot \frac{100\text{ m}}{48\text{ m}}$$

Evaluate Formula ↻

6) Correction to Second Bearing for given Closing Error Formula ↻

Formula

$$c_{n2} = \left(2 \cdot \frac{e}{N_{\text{Sides}}} \right) \cdot \left(\frac{\pi}{180} \right)$$

Example with Units

$$50^\circ = \left(2 \cdot \frac{50\text{ m}}{2} \right) \cdot \left(\frac{3.1416}{180} \right)$$

Evaluate Formula ↻



7) Direction of Closing Error in Traversing Formula

Formula

$$\tan \theta = \frac{\Sigma D}{\Sigma L}$$

Example with Units

$$0.75 = \frac{30 \text{ m}}{40 \text{ m}}$$

Evaluate Formula 

8) Sum of Departure given Direction of Closing Error Formula

Formula

$$\Sigma D = \tan \theta \cdot \Sigma L$$

Example with Units

$$30 \text{ m} = 0.75 \cdot 40 \text{ m}$$

Evaluate Formula 

9) Sum of Departures given Closing Error Formula

Formula

$$\Sigma D = \sqrt{e^2 - \Sigma L^2}$$

Example with Units

$$30 \text{ m} = \sqrt{50 \text{ m}^2 - 40 \text{ m}^2}$$

Evaluate Formula 

10) Sum of Latitudes given Closing Error Formula

Formula

$$\Sigma L = \sqrt{e^2 - \Sigma D^2}$$

Example with Units

$$40 \text{ m} = \sqrt{50 \text{ m}^2 - 30 \text{ m}^2}$$

Evaluate Formula 

11) Sum of Latitudes given Direction of Closing Error Formula

Formula

$$\Sigma L = \frac{\Sigma D}{\tan \theta}$$

Example with Units

$$40 \text{ m} = \frac{30 \text{ m}}{0.75}$$

Evaluate Formula 

12) Total Error in Latitude if Correction is Known from Bowditch Rule Formula

Formula

$$e_{l/r} = c_{l/r} \cdot \frac{P}{L}$$

Example with Units

$$48.875 \text{ m} = 11.5 \text{ m} \cdot \frac{85 \text{ m}}{20 \text{ m}}$$

Evaluate Formula 



Variables used in list of Traversing Formulas above

- **C_b** Correction to First Bearing (Degree)
- **$C_{l/r}$** Correction to Latitude (Meter)
- **C_{n2}** Correction to Second Bearing (Degree)
- **e** Closing Error (Meter)
- **$e_{l/r}$** Error in Latitude (Meter)
- **L** Latitude of Line (Meter)
- **n** Northing (Meter)
- **N_{Sides}** Number of Sides
- **P** Perimeter of Traverse (Meter)
- **ΣD** Sum of Departures (Meter)
- **ΣL** Sum of Latitudes (Meter)
- **Σn** Sum of Northings (Meter)
- **$\tan\theta$** Direction of Closing Error

Constants, Functions, Measurements used in list of Traversing Formulas above

- **constant(s):** π ,
3.14159265358979323846264338327950288
Archimedes' constant
- **Functions:** **sqrt**, sqrt(Number)
A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- **Measurement: Length** in Meter (m)
Length Unit Conversion 
- **Measurement: Angle** in Degree ($^{\circ}$)
Angle Unit Conversion 



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