

Important Compass Surveying Formulas PDF



Formulas Examples with Units

List of 10 Important Compass Surveying Formulas

1) Fore Bearing in Whole Circle Bearing System Formula

Formula

$$FB = \left(BB - \left(180 \cdot \frac{\pi}{180} \right) \right)$$

Example with Units

$$50.8584_{\text{rad}} = \left(54_{\text{rad}} - \left(180 \cdot \frac{3.1416}{180} \right) \right)$$

Evaluate Formula 

2) Included Angle from Two Lines Formula

Formula

$$\theta = \alpha - \beta$$

Example with Units

$$60^\circ = 90^\circ - 30^\circ$$

Evaluate Formula 

3) Included Angle when Bearings are Measured in Opposite Side of Common Meridian Formula

Formula

$$\theta = \beta + \alpha$$

Example with Units

$$120^\circ = 30^\circ + 90^\circ$$

Evaluate Formula 

4) Included Angle when Bearings are Measured in Same Side of Different Meridian Formula

Formula

$$\theta = \left(180 \cdot \frac{\pi}{180} \right) - (\alpha + \beta)$$

Example with Units

$$60^\circ = \left(180 \cdot \frac{3.1416}{180} \right) - (90^\circ + 30^\circ)$$

Evaluate Formula 

5) Magnetic Bearing given True Bearing with East Declination Formula

Formula

$$MB = TB - MD$$

Example with Units

$$55^\circ = 60^\circ - 5^\circ$$

Evaluate Formula 

6) Magnetic Bearing given True Bearing with West Declination Formula

Formula

$$MB = TB + MD$$

Example with Units

$$65^\circ = 60^\circ + 5^\circ$$

Evaluate Formula 

7) Magnetic Declination to East Formula

Formula

$$MD = TB - MB$$

Example with Units

$$5^\circ = 60^\circ - 55^\circ$$

Evaluate Formula 



8) Magnetic Declination to West Formula

Formula

$$MD = MB - TB$$

Example with Units

$$-5^{\circ} = 55^{\circ} - 60^{\circ}$$

Evaluate Formula 

9) True Bearing if Declination is in East Formula

Formula

$$TB = MB + MD$$

Example with Units

$$60^{\circ} = 55^{\circ} + 5^{\circ}$$

Evaluate Formula 

10) True Bearing if Declination is in West Formula

Formula

$$TB = MB - MD$$

Example with Units

$$50^{\circ} = 55^{\circ} - 5^{\circ}$$

Evaluate Formula 



Variables used in list of Compass Surveying Formulas above







- **BB** Back Bearing (*Radian*)
- **FB** Fore Bearing (*Radian*)
- **MB** Magnetic Bearing (*Degree*)
- **MD** Magnetic Declination (*Degree*)
- **TB** True Bearing (*Degree*)
- α Fore Bearing of Previous Line (*Degree*)
- β Back Bearing of Previous Line (*Degree*)
- θ Included Angle (*Degree*)
- θ' Included Angle when Bearings are in Opposite Side (*Degree*)

Constants, Functions, Measurements used in list of Compass Surveying Formulas above



- **constant(s):** pi,
3.14159265358979323846264338327950288
Archimedes' constant
- **Measurement: Angle** in Radian (rad), Degree (°)
Angle Unit Conversion 



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9/18/2024 | 10:27:20 AM UTC

