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Compass Surveying Formulas

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List of 10 Compass Surveying Formulas

Compass Surveying

1) Fore Bearing in Whole Circle Bearing System

Open Calculator

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

ex $$50.85841\mathrm{rad} = \left(54\mathrm{rad} - \left(180 \cdot \frac{\pi}{180}\right)\right)$$

2) Included Angle from Two Lines

Open Calculator

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

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

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

Open Calculator

fx $$\theta' = \beta + \alpha$$

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

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

Open Calculator

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

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

5) Magnetic Bearing given True Bearing with East Declination

Open Calculator

fx $$MB = TB - MD$$

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

6) Magnetic Bearing given True Bearing with West Declination

Open Calculator

fx $$MB = TB + MD$$

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

7) Magnetic Declination to East

Open Calculator

fx $$MD = TB - MB$$

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

8) Magnetic Declination to West

Open Calculator

fx $$MD = MB - TB$$

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

9) True Bearing if Declination is in East

Open Calculator

fx $$\mathrm{TB} = \mathrm{MB} + \mathrm{MD}$$

ex $$60^\circ = 55^\circ + 5^\circ$$

10) True Bearing if Declination is in West

Open Calculator

fx $$\mathrm{TB} = \mathrm{MB} - \mathrm{MD}$$

ex $$50^\circ = 55^\circ - 5^\circ$$

Variables Used

- **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

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

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