



calculatoratoz.com



unitsconverters.com

Curvilinear Motion Formulas

Calculators!

Examples!

Conversions!

Bookmark calculatoratoz.com, unitsconverters.com

Widest Coverage of Calculators and Growing - **30,000+ Calculators!**
Calculate With a Different Unit for Each Variable - **In built Unit Conversion!**
Widest Collection of Measurements and Units - **250+ Measurements!**

Feel free to SHARE this document with your friends!

[Please leave your feedback here...](#)



List of 11 Curvilinear Motion Formulas

Curvilinear Motion

1) Angular Acceleration given Linear Acceleration

$$\text{fx } \alpha_{\text{cm}} = \frac{a_{\text{cm}}}{r}$$

[Open Calculator !\[\]\(a870788d6ed9b8fd294b7654a8c8526b_img.jpg\)](#)

$$\text{ex } 8.101449\text{rad/s}^2 = \frac{5.59\text{m/s}^2}{0.69\text{m}}$$

2) Angular Displacement given Angular Acceleration

$$\text{fx } \theta_{\text{cm}} = \omega_{\text{in}} \cdot t_{\text{cm}} + \frac{1}{2} \cdot \alpha_{\text{cm}} \cdot t_{\text{cm}}^2$$

[Open Calculator !\[\]\(c50c8b7b2cc2cf9ff925edec0ee94c0d_img.jpg\)](#)

$$\text{ex } 6187.944^\circ = 24\text{rad/s} \cdot 3\text{s} + \frac{1}{2} \cdot 8\text{rad/s}^2 \cdot (3\text{s})^2$$

3) Angular Velocity given Linear Velocity

$$\text{fx } \omega = \frac{v_{\text{cm}}}{r}$$

[Open Calculator !\[\]\(f60b7a900783ac3fd531bfd9c111be6d_img.jpg\)](#)

$$\text{ex } 36.23188\text{rad/s} = \frac{25\text{m/s}}{0.69\text{m}}$$



4) Angular Velocity of Body Moving in Circle

[Open Calculator !\[\]\(4729e517bc6a7cd81c8025b9646574fb_img.jpg\)](#)

$$fx \quad \omega = \frac{\theta_{cm}}{t_{cm}}$$

$$ex \quad 35.99451 \text{rad/s} = \frac{6187^\circ}{3s}$$

5) Average Angular Velocity

[Open Calculator !\[\]\(e474458956c9a37fbf9586ddb60a7fa1_img.jpg\)](#)

$$fx \quad \omega = \frac{\omega_{in} + \omega_{fi}}{2}$$

$$ex \quad 36 \text{rad/s} = \frac{24 \text{rad/s} + 48 \text{rad/s}}{2}$$

6) Final Angular Velocity

[Open Calculator !\[\]\(4fe57c3593bf1b21d272ae7ac8dfaf77_img.jpg\)](#)

$$fx \quad \omega_{fi} = \omega_{in} + \alpha_{cm} \cdot t_{cm}$$

$$ex \quad 48 \text{rad/s} = 24 \text{rad/s} + 8 \text{rad/s}^2 \cdot 3s$$

7) Initial Angular Velocity

[Open Calculator !\[\]\(2bae76de5ebbd5c4d7d47162f1673734_img.jpg\)](#)

$$fx \quad \omega_{in} = \omega_{fi} - \alpha_{cm} \cdot t_{cm}$$

$$ex \quad 24 \text{rad/s} = 48 \text{rad/s} - 8 \text{rad/s}^2 \cdot 3s$$



8) Linear Acceleration in Curvilinear Motion

$$fx \quad a_{cm} = \alpha_{cm} \cdot r$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95_img.jpg\)](#)

$$ex \quad 5.52m/s^2 = 8rad/s^2 \cdot 0.69m$$

9) Radius of Curvilinear Motion given Angular velocity

$$fx \quad r = \frac{v_{cm}}{\omega}$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2_img.jpg\)](#)

$$ex \quad 0.694444m = \frac{25m/s}{36rad/s}$$

10) Radius of Curvilinear Motion given Linear Acceleration

$$fx \quad r = \frac{a_{cm}}{\alpha_{cm}}$$

[Open Calculator !\[\]\(fe3aebe81acea8d45108cd2768939da7_img.jpg\)](#)

$$ex \quad 0.69875m = \frac{5.59m/s^2}{8rad/s^2}$$

11) Velocity in Curvilinear Motion given Angular Velocity

$$fx \quad v_{cm} = \omega \cdot r$$

[Open Calculator !\[\]\(899d8b7697d64725bf017d3296cfcf1b_img.jpg\)](#)

$$ex \quad 24.84m/s = 36rad/s \cdot 0.69m$$










Variables Used

- a_{cm} Acceleration For Curvilinear Motion (Meter per Square Second)
- r Radius (Meter)
- t_{cm} Time Period (Second)
- v_{cm} Velocity of Curvilinear Motion (Meter per Second)
- α_{cm} Angular Acceleration (Radian per Square Second)
- θ_{cm} Angular Displacement (Degree)
- ω Angular Velocity (Radian per Second)
- ω_{fi} Final Angular Velocity of Object (Radian per Second)
- ω_{in} Initial Angular Velocity of Object (Radian per Second)



Constants, Functions, Measurements used

- **Measurement: Length** in Meter (m)
Length Unit Conversion 
- **Measurement: Time** in Second (s)
Time Unit Conversion 
- **Measurement: Speed** in Meter per Second (m/s)
Speed Unit Conversion 
- **Measurement: Acceleration** in Meter per Square Second (m/s²)
Acceleration Unit Conversion 
- **Measurement: Angle** in Degree (°)
Angle Unit Conversion 
- **Measurement: Angular Velocity** in Radian per Second (rad/s)
Angular Velocity Unit Conversion 
- **Measurement: Angular Acceleration** in Radian per Square Second (rad/s²)
Angular Acceleration Unit Conversion 



Check other formula lists

- [Curvilinear Motion Formulas](#) 
- [Motion in Bodies Hanging by String Formulas](#) 
- [Motion in Bodies Connected by Strings Formulas](#) 
- [Projectile Motion Formulas](#) 

Feel free to SHARE this document with your friends!

PDF Available in

[English](#) [Spanish](#) [French](#) [German](#) [Russian](#) [Italian](#) [Portuguese](#) [Polish](#) [Dutch](#)

9/11/2024 | 7:56:07 AM UTC

[Please leave your feedback here...](#)

