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Maximum Velocity of the Follower Formulas

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List of 11 Maximum Velocity of the Follower Formulas

Maximum Velocity of the Follower

1) Max Velocity of Follower for Tangent Cam with Roller Follower

$$\text{fx } V_m = \omega \cdot (r_1 + r_r) \cdot \frac{\sin(\varphi)}{\cos(\varphi)^2}$$

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

$$\text{ex } 80.09146\text{m/s} = 27\text{rad/s} \cdot (3\text{m} + 31\text{m}) \cdot \frac{\sin(0.0867\text{rad})}{\cos(0.0867\text{rad})^2}$$

2) Maximum Velocity of Follower during Outstroke at Uniform Acceleration

$$\text{fx } V_m = \frac{2 \cdot S \cdot \omega}{\theta_o}$$

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

$$\text{ex } 80\text{m/s} = \frac{2 \cdot 20\text{m} \cdot 27\text{rad/s}}{13.50\text{rad}}$$



3) Maximum Velocity of Follower during Outstroke at Uniform Acceleration given Time of Out Stroke

$$\text{fx } V_m = \frac{2 \cdot S}{t_o}$$

[Open Calculator !\[\]\(cbe80b694ebd74fcfe136a095b608235_img.jpg\)](#)

$$\text{ex } 80\text{m/s} = \frac{2 \cdot 20\text{m}}{0.50\text{s}}$$

4) Maximum Velocity of Follower during Outstroke for Cycloidal Motion

$$\text{fx } V_m = \frac{2 \cdot \omega \cdot S}{\theta_o}$$

[Open Calculator !\[\]\(3e2231b1ad3ca8da8658228c00dd08e0_img.jpg\)](#)

$$\text{ex } 80\text{m/s} = \frac{2 \cdot 27\text{rad/s} \cdot 20\text{m}}{13.50\text{rad}}$$

5) Maximum Velocity of Follower during Return Stroke at Uniform Acceleration given Time of Stroke

$$\text{fx } V_m = \frac{2 \cdot S}{t_R}$$

[Open Calculator !\[\]\(0d5ec72f61334709c3fc9450209b754f_img.jpg\)](#)

$$\text{ex } 80\text{m/s} = \frac{2 \cdot 20\text{m}}{0.5\text{s}}$$



6) Maximum Velocity of Follower during Return Stroke for Cycloidal Motion

$$\text{fx } V_m = \frac{2 \cdot \omega \cdot S}{\theta_R}$$

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

$$\text{ex } 80\text{m/s} = \frac{2 \cdot 27\text{rad/s} \cdot 20\text{m}}{13.5\text{rad}}$$

7) Maximum Velocity of Follower during Return Stroke for Uniform Acceleration

$$\text{fx } V_m = \frac{2 \cdot S \cdot \omega}{\theta_R}$$

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

$$\text{ex } 80\text{m/s} = \frac{2 \cdot 20\text{m} \cdot 27\text{rad/s}}{13.5\text{rad}}$$

8) Maximum Velocity of Follower for Circular Arc Cam Contacting with Circular Flank

$$\text{fx } V_m = \omega \cdot (R - r_1) \cdot \sin(2\alpha)$$

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

$$\text{ex } 80.08657\text{m/s} = 27\text{rad/s} \cdot (5.97\text{m} - 3\text{m}) \cdot \sin(1.52\text{rad})$$

9) Maximum Velocity of Follower on Outstroke given Time Stroke

$$\text{fx } V_m = \frac{\pi \cdot S}{2 \cdot t_o}$$

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

$$\text{ex } 62.83185\text{m/s} = \frac{\pi \cdot 20\text{m}}{2 \cdot 0.50\text{s}}$$



10) Maximum Velocity of Follower on Outstroke when Follower Moves with SHM

$$\text{fx } V_m = \frac{\pi \cdot S \cdot \omega}{2 \cdot \theta_o}$$

[Open Calculator !\[\]\(e2376d476d06eb31946dc01a69a4403a_img.jpg\)](#)

$$\text{ex } 62.83185\text{m/s} = \frac{\pi \cdot 20\text{m} \cdot 27\text{rad/s}}{2 \cdot 13.50\text{rad}}$$

11) Maximum Velocity of Follower on Return Stroke when Follower Moves with SHM

$$\text{fx } V_m = \frac{\pi \cdot S \cdot \omega}{2 \cdot \theta_R}$$

[Open Calculator !\[\]\(0b5e7e25e8775f7e7e80906ada4f0021_img.jpg\)](#)

$$\text{ex } 62.83185\text{m/s} = \frac{\pi \cdot 20\text{m} \cdot 27\text{rad/s}}{2 \cdot 13.5\text{rad}}$$








Variables Used

- 2α Total Angle of Action of Cam (Radian)
- R Radius of Circular Flank (Meter)
- r_1 Radius of The Base Circle (Meter)
- r_r Radius of Roller (Meter)
- S Stroke of Follower (Meter)
- t_o Time Required For The Outstroke (Second)
- t_R Time Required For The Return Stroke (Second)
- V_m Maximum Velocity of Follower (Meter per Second)
- θ_o Angular Displacement of Cam During Out Stroke (Radian)
- θ_R Angular Displacement of Cam During Return Stroke (Radian)
- ϕ Angle Turned By The Cam For Contact of Roller (Radian)
- ω Angular Velocity of Cam (Radian per Second)



Constants, Functions, Measurements used

- **Constant:** **pi**, 3.14159265358979323846264338327950288
Archimedes' constant
- **Function:** **cos**, $\cos(\text{Angle})$
Cosine of an angle is the ratio of the side adjacent to the angle to the hypotenuse of the triangle.
- **Function:** **sin**, $\sin(\text{Angle})$
Sine is a trigonometric function that describes the ratio of the length of the opposite side of a right triangle to the length of the hypotenuse.
- **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:** **Angle** in Radian (rad)
Angle Unit Conversion 
- **Measurement:** **Angular Velocity** in Radian per Second (rad/s)
Angular Velocity Unit Conversion 



Check other formula lists

- [Acceleration of the Follower Formulas](#) 
- [Cam and Follower Formulas](#) 
- [Maximum Velocity of the Follower Formulas](#) 

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