



## **Cycloid Formulas**

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### **List of 30 Cycloid Formulas**

### Cycloid 2

### Area of Cycloid

1) Area of Cycloid

fx 
$$A=3\cdot\pi\cdot r_{
m Circle}^2$$

 $\mathbf{ex} \left[ 235.6194 \mathrm{m}^2 = 3 \cdot \pi \cdot (5 \mathrm{m})^2 
ight]$ 

 $\left| \mathbf{A} = 3 \cdot \pi \cdot \left( rac{\mathrm{l}_{\mathrm{Arc}}}{8} 
ight)^2 
ight|$ 

 $extbf{ex} \left[ 235.6194 ext{m}^2 = 3 \cdot \pi \cdot \left( rac{40 ext{m}}{8} 
ight)^2 
ight]$ 

### 3) Area of Cycloid given Base Length

 $\left| \mathbf{f} \mathbf{x} 
ight| \mathbf{A} = 3 \cdot \pi \cdot \left( rac{\mathbf{l}_{\mathrm{Base}}}{2 \cdot \pi} 
ight)^2 
ight|$ 

ex  $214.8592 ext{m}^2=3\cdot\pi\cdot\left(rac{30 ext{m}}{2\cdot\pi}
ight)^2$ 





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# 4) Area of Cycloid given Height

 $\left| \mathbf{A} = 3 \cdot \pi \cdot \left( rac{\mathrm{h}}{2} 
ight)^2 
ight|$ 

ex  $235.6194 ext{m}^2=3\cdot\pi\cdot\left(rac{10 ext{m}}{2}
ight)^2$ 

5) Area of Cycloid given Perimeter 🖸

 $\mathbf{K} A = 3 \cdot \pi \cdot \left( \frac{\mathrm{P}}{8 + (2 \cdot \pi)} \right)^2$ 

 $oxed{ex} \left[ 226.3691 \mathrm{m}^2 = 3 \cdot \pi \cdot \left( rac{70 \mathrm{m}}{8 + (2 \cdot \pi)} 
ight)^2 
ight]$ 

Height of Cycloid

6) Height of Cycloid G

fx  $m h = 2 \cdot r_{Circle}$ 

 $|\mathbf{ex}| 10 \mathbf{m} = 2 \cdot 5 \mathbf{m}$ 

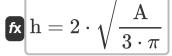
7) Height of Cycloid given Arc Length

 $h = \frac{l_{Arc}}{4}$ 

 $\boxed{10\text{m} = \frac{40\text{m}}{4}}$ 

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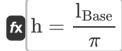
### 8) Height of Cycloid given Area



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 $= 2 \cdot \sqrt{rac{235 ext{m}^2}{3 \cdot \pi}}$ 

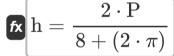
### 9) Height of Cycloid given Base Length



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=  $9.549297 \mathrm{m} = rac{30 \mathrm{m}}{\pi}$ 

### 10) Height of Cycloid given Perimeter



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 $9.801735 \text{m} = \frac{2 \cdot 70 \text{m}}{8 + (2 \cdot \pi)}$ 

### Length of Cycloid 🗗



### Arc Length of Cycloid G

# 11) Arc Length of Cycloid 🔄

fx  $l_{
m Arc} = 8 \cdot r_{
m Circle}$ 

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 $|40m| = 8 \cdot 5m$ 

### 12) Arc Length of Cycloid given Area

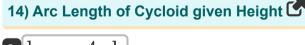
 $\left| \mathbf{l}_{\mathrm{Arc}} = 8 \cdot \sqrt{rac{\mathrm{A}}{3 \cdot \pi}} 
ight|$ 

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 $39.94738 \text{m} = 8 \cdot \sqrt{\frac{235 \text{m}^2}{3 \cdot \pi}}$ 

### 13) Arc Length of Cycloid given Base Length

 $all_{
m Arc} = rac{4 \cdot l_{
m Base}}{\pi}$  $38.19719 \text{m} = \frac{4 \cdot 30 \text{m}}{2}$ 



fx  $m l_{Arc} = 4 \cdot h 
m l$ 

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**ex**  $40 \text{m} = 4 \cdot 10 \text{m}$ 







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# 15) Arc Length of Cycloid given Perimeter G

 $l_{
m Arc} = rac{8 \cdot P}{8 + (2 \cdot \pi)}$ 

### Base Length of Cycloid

16) Base Length of Cycloid G

fx  $m l_{Base} = 2 \cdot \pi \cdot r_{Circle}$ 

**ex** 31.41593m =  $2 \cdot \pi \cdot 5$ m

### 17) Base Length of Cycloid given Arc Length

 $l_{
m Base} = rac{\pi}{4} \cdot l_{
m Arc}$  $= \frac{\pi}{4} \cdot 40 \text{m}$ 

## 18) Base Length of Cycloid given Area 🛂

 $l_{ ext{Base}} = 2 \cdot \pi \cdot \sqrt{rac{ ext{A}}{3 \cdot \pi}}$ 

$$\mathbf{v} \cdot \mathbf{3} \cdot \mathbf{\pi}$$
  $\mathbf{ex}$   $31.3746 \mathrm{m} = 2 \cdot \mathbf{\pi} \cdot \sqrt{\frac{235 \mathrm{m}^2}{3 \cdot \mathbf{\pi}}}$ 







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### 19) Base Length of Cycloid given Height G

fx  $l_{\mathrm{Base}} = \pi \cdot h$ 

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 $\mathbf{ex} \ 31.41593 \mathrm{m} = \pi \cdot 10 \mathrm{m}$ 

### 20) Base Length of Cycloid given Perimeter

 $l_{
m Base} = rac{2 \cdot \pi \cdot {
m P}}{8 + (2 \cdot \pi)}$ 

$$\frac{\pi \cdot P}{(2 \cdot \pi)}$$

 $\mathbf{ex}$  30.79306m =  $\frac{2 \cdot \pi \cdot 70 \text{m}}{8 + (2 \cdot \pi)}$ 

# Perimeter of Cycloid

### 21) Perimeter of Cycloid G

fx  $P = (8 + (2 \cdot \pi)) \cdot r_{Circle}$ 

22) Perimeter of Cycloid given Arc Length



 $P = (8 + (2 \cdot \pi)) \cdot \frac{1_{Arc}}{Q}$ 

ex 
$$71.41593 \mathrm{m} = (8 + (2 \cdot \pi)) \cdot \frac{40 \mathrm{m}}{8}$$





### 23) Perimeter of Cycloid given Area

/ A

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 $P = (8 + (2 \cdot \pi)) \cdot \sqrt{\frac{A}{3 \cdot \pi}}$ 

ex  $71.32199 \mathrm{m} = (8 + (2 \cdot \pi)) \cdot \sqrt{\frac{235 \mathrm{m}^2}{3 \cdot \pi}}$ 

### 24) Perimeter of Cycloid given Base Length

 $\mathbf{F} = (8 + (2 \cdot \pi)) \cdot rac{\mathrm{l}_{\mathrm{Base}}}{2 \cdot \pi}$ 

=  $68.19719 \mathrm{m} = (8 + (2 \cdot \pi)) \cdot \frac{30 \mathrm{m}}{2 \cdot \pi}$ 

### 25) Perimeter of Cycloid given Height 🗗

extstyle ext

=  $(8 + (2 \cdot \pi)) \cdot \frac{10 \text{m}}{2}$ 

### Radius of Circle of Cycloid

### 26) Radius of Circle of Cycloid given Arc Length

$${
m r_{Circle}}=rac{{
m l_{Arc}}}{8}$$

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 $\boxed{5m = \frac{40m}{8}}$ 

### 27) Radius of Circle of Cycloid given Area



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ex  $4.993423 \mathrm{m} = \sqrt{rac{235 \mathrm{m}^2}{3 \cdot \pi}}$ 

### 28) Radius of Circle of Cycloid given Base Length 🗹

$${f r}_{
m Circle} = rac{{
m l}_{
m Base}}{2 \cdot \pi}$$

=  $4.774648m = \frac{30m}{2 \cdot \pi}$ 



### 29) Radius of Circle of Cycloid given Height

 $\mathbf{f}_{\mathrm{Circle}} = rac{\mathrm{h}}{2}$ 

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$$5m = \frac{10m}{2}$$

### 30) Radius of Circle of Cycloid given Perimeter

 ${
m r_{Circle}} = rac{{
m P}}{8 + (2 \cdot \pi)}$ 

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$$=$$
  $4.900868 \mathrm{m} = rac{70 \mathrm{m}}{8 + (2 \cdot \pi)}$ 



Cycloid Formulas...

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#### Variables Used

- A Area of Cycloid (Square Meter)
- **h** Height of Cycloid (Meter)
- I<sub>Arc</sub> Arc Length of Cycloid (Meter)
- IBase Base Length of Cycloid (Meter)
- P Perimeter of Cycloid (Meter)
- r<sub>Circle</sub> Radius of Circle of Cycloid (Meter)





### Constants, Functions, Measurements used

- Constant: pi, 3.14159265358979323846264338327950288
   Archimedes' constant
- Function: sqrt, sqrt(Number)
  Square root function
- Measurement: Length in Meter (m)

  Length Unit Conversion
- Measurement: Area in Square Meter (m²)

  Area Unit Conversion





#### **Check other formula lists**

- Annulus Formulas
- Antiparallelogram Formulas
- Arrow Hexagon Formulas
- Astroid Formulas
- Bulge Formulas
- Cardioid Formulas
- Circular Arc Quadrangle
   Formulas
- Concave Pentagon Formulas
- Concave Quadrilateral
   Formulas
- Concave Regular Hexagon
   Formulas
- Concave Regular Pentagon
   Formulas
- Crossed Rectangle Formulas
- Cut Rectangle Formulas
- Cyclic Quadrilateral Formulas
- Cycloid Formulas
- Decagon Formulas
- Dodecagon Formulas
- Double Cycloid Formulas
- Fourstar Formulas
- Frame Formulas
- Golden Rectangle Formulas 🗗
- Grid Formulas
- H Shape Formulas

- Half Yin-Yang Formulas
- Heart Shape Formulas
- Hendecagon Formulas
- Heptagon Formulas
- Hexadecagon Formulas
- Hexagon Formulas
- Hexagram Formulas 💪
- House Shape Formulas
- Hyperbola Formulas
- Hypocycloid Formulas
- Isosceles Trapezoid Formulas
- Koch Curve Formulas
- L Shape Formulas
- Line Formulas
- Lune Formulas
- N-gon Formulas
- Nonagon Formulas
- Octagon Formulas
- Octagram Formulas
- Open Frame Formulas
- Parallelogram Formulas
- Pentagon Formulas
- Pentagram Formulas
- Polygram Formulas
- Quadrilateral Formulas
- Quarter Circle Formulas
- Rectangle Formulas

- Rectangular Hexagon
   Formulas
- Regular Polygon Formulas
- 🔹 Reuleaux Triangle Formulas Ğ
- Rhombus Formulas
- Right Trapezoid Formulas
- Round Corner Formulas
- Salinon Formulas
- Semicircle Formulas
- Sharp Kink Formulas
- Square Formulas

- Star of Lakshmi Formulas
- Stretched Hexagon Formulas
- T Shape Formulas
- Tangential Quadrilateral Formulas
- Trapezoid Formulas
- Tricorn Formulas
- Tri-equilateral Trapezoid
   Formulas
- Truncated Square Formulas
- Unicursal Hexagram\_Formulas
- X Shape Formulas

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