



# **Solid of Revolution Formulas**

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### **List of 16 Solid of Revolution Formulas**

# Solid of Revolution &

## Area under Curve of Solid of Revolution &

1) Area under Curve of Solid of Revolution 🖸

$$\mathbf{A}_{\mathrm{Curve}} = rac{\mathrm{LSA} + \left( \left( \left( \mathrm{r}_{\mathrm{Top}} + \mathrm{r}_{\mathrm{Bottom}} 
ight)^2 
ight) \cdot \pi 
ight)}{2 \cdot \pi \cdot \mathrm{r}_{\mathrm{Area~Centroid}} \cdot \mathrm{R}_{\mathrm{A/V}}}$$

Open Calculator 🚰

$$ag{52.92344} {
m m}^2 = rac{2360 {
m m}^2 + \left(\left((10 {
m m} + 20 {
m m})^2
ight) \cdot \pi
ight)}{2 \cdot \pi \cdot 12 {
m m} \cdot 1.3 {
m m}^{-1}}$$

### 2) Area under Curve of Solid of Revolution given Volume

$$\mathbf{A}_{\mathrm{Curve}} = rac{\mathrm{V}}{2 \cdot \pi \cdot \mathrm{r}_{\mathrm{Area~Centroid}}}$$

Open Calculator 🗗

$$\mathbf{ex} \left[ 50.39907 \mathrm{m}^{_{2}} = rac{3800 \mathrm{m}^{_{3}}}{2 \cdot \pi \cdot 12 \mathrm{m}} 
ight]$$

# Curve Length of Solid of Revolution &

3) Curve Length of Solid of Revolution

$$all_{ ext{Curve}} = \left(rac{ ext{LSA}}{2 \cdot \pi \cdot ext{r}_{ ext{Curve Centroid}}}
ight)$$

Open Calculator

$$oxed{ex} 25.04038 \mathrm{m} = \left(rac{2360 \mathrm{m}^2}{2 \cdot \pi \cdot 15 \mathrm{m}}
ight)$$





# Radius of Solid of Revolution &

# Bottom Radius of Solid of Revolution

## 4) Bottom Radius of Solid of Revolution

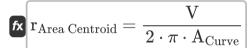
$$\mathbf{r}_{\mathrm{Bottom}} = \left(\sqrt{rac{\mathrm{TSA} - \mathrm{LSA}}{\pi}}
ight) - \mathbf{r}_{\mathrm{Top}}$$

Open Calculator

$$\mathbf{ex}$$
  $20.06659 \mathrm{m} = \left( \sqrt{rac{5200 \mathrm{m}^2 - 2360 \mathrm{m}^2}{\pi}} 
ight) - 10 \mathrm{m}$ 

## Radius at Area Centroid of Solid of Revolution

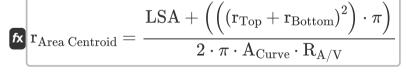
# 5) Radius at Area Centroid of Solid of Revolution



Open Calculator 🗗

ex 
$$12.09578 \mathrm{m} = rac{3800 \mathrm{m}^3}{2 \cdot \pi \cdot 50 \mathrm{m}^2}$$

# 6) Radius at Area Centroid of Solid of Revolution given Surface to Volume Ratio 🗹



Open Calculator

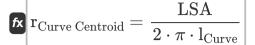
$$oxed{ex} 12.70163 \mathrm{m} = rac{2360 \mathrm{m}^2 + \left( \left( \left( 10 \mathrm{m} + 20 \mathrm{m} 
ight)^2 
ight) \cdot \pi 
ight)}{2 \cdot \pi \cdot 50 \mathrm{m}^2 \cdot 1.3 \mathrm{m}^{-1}}$$





### Radius at Curve Centroid of Solid of Revolution

7) Radius at Curve Centroid of Solid of Revolution



$$=$$
  $15.02423 \mathrm{m} = rac{2360 \mathrm{m}^2}{2 \cdot \pi \cdot 25 \mathrm{m}}$ 

# Top Radius of Solid of Revolution

8) Top Radius of Solid of Revolution

$$\mathbf{r}_{\mathrm{Top}} = \left(\sqrt{rac{\mathrm{TSA} - \mathrm{LSA}}{\pi}}
ight) - \mathbf{r}_{\mathrm{Bottom}}$$

Open Calculator

$$10.06659 \mathrm{m} = \left(\sqrt{\frac{5200 \mathrm{m}^2 - 2360 \mathrm{m}^2}{\pi}}\right) - 20 \mathrm{m}$$

Surface Area of Solid of Revolution 🗗

Lateral Surface Area of Solid of Revolution

- 9) Lateral Surface Area of Solid of Revolution
- fx  $ext{LSA} = 2 \cdot \pi \cdot l_{ ext{Curve}} \cdot r_{ ext{Curve Centroid}}$

Open Calculator 🗗

ex 
$$2356.194 \mathrm{m}^2 = 2 \cdot \pi \cdot 25 \mathrm{m} \cdot 15 \mathrm{m}$$



### 10) Lateral Surface Area of Solid of Revolution given Surface to Volume Ratio

Open Calculator

fx  $ext{LSA} = \left( ext{R}_{ ext{A/V}} \cdot 2 \cdot \pi \cdot ext{A}_{ ext{Curve}} \cdot ext{r}_{ ext{Area Centroid}} 
ight) - \left( \left( ( ext{r}_{ ext{Top}} + ext{r}_{ ext{Bottom}})^2 
ight) \cdot \pi 
ight)$ 

 $oxed{ex} 2073.451 \mathrm{m}^{_2} = (1.3 \mathrm{m}^{_{-1}} \cdot 2 \cdot \pi \cdot 50 \mathrm{m}^{_2} \cdot 12 \mathrm{m}) - \left( \left( (10 \mathrm{m} + 20 \mathrm{m})^2 
ight) \cdot \pi 
ight)$ 

# 11) Lateral Surface Area of Solid of Revolution given Total Surface Area

Open Calculator extstyle ext

 $\mathbf{ex} \ 2372.567 \mathrm{m}^2 = 5200 \mathrm{m}^2 - \left( \left( \left( 10 \mathrm{m} + 20 \mathrm{m} \right)^2 \right) \cdot \pi 
ight)$ 

## Total Surface Area of Solid of Revolution

# 12) Total Surface Area of Solid of Revolution

 $ag{TSA} = ext{LSA} + \left( \left( \left( ext{r}_{ ext{Top}} + ext{r}_{ ext{Bottom}} 
ight)^2 
ight) \cdot \pi 
ight)$ 

Open Calculator

 $\mathbf{ex} \ 5187.433 \mathrm{m}^2 = 2360 \mathrm{m}^2 + \left( \left( (10 \mathrm{m} + 20 \mathrm{m})^2 \right) \cdot \pi \right)$ 

# Surface to Volume Ratio of Solid of Revolution

# 13) Surface to Volume Ratio of Solid of Revolution

 $ext{LSA} + \left( \left( \left( ext{r}_{ ext{Top}} + ext{r}_{ ext{Bottom}} 
ight)^2 
ight) \cdot \pi 
ight)$  $m_{R_{A/V}} = rac{1}{2 \cdot \pi \cdot A_{Curve} \cdot r_{Area\ Centroid}}$ 

Open Calculator

 $oxed{ex} 1.376009 \mathrm{m}^{-1} = rac{2360 \mathrm{m}^2 + \left( \left( \left( 10 \mathrm{m} + 20 \mathrm{m} 
ight)^2 
ight) \cdot \pi 
ight)}{2}$ 





## Volume of Solid of Revolution

### 14) Volume of Solid of Revolution

 $extbf{K} V = 2 \cdot \pi \cdot ext{A}_{ ext{Curve}} \cdot ext{r}_{ ext{Area Centroid}}$ 

Open Calculator

Open Calculator

Open Calculator 🚰

ex  $3769.911 \mathrm{m}^{_3} = 2 \cdot \pi \cdot 50 \mathrm{m}^{_2} \cdot 12 \mathrm{m}$ 

### 15) Volume of Solid of Revolution given Lateral Surface Area

\_\_\_\_\_\_

$$egin{aligned} \mathbf{K} \ V = (2 \cdot \pi \cdot \mathrm{A}_{\mathrm{Curve}}) \cdot \left( rac{\mathrm{LSA} + \left( \left( \left( \mathrm{r}_{\mathrm{Top}} + \mathrm{r}_{\mathrm{Bottom}} 
ight)^2 
ight) \cdot \pi 
ight)}{2 \cdot \pi \cdot \mathrm{A}_{\mathrm{Curve}} \cdot \mathrm{R}_{\mathrm{A/V}}} 
ight) \end{aligned}$$

### 16) Volume of Solid of Revolution given Surface to Volume Ratio

16) volume of Solid of Revolution given Surface to volume Ratio

$$ext{V} = (2 \cdot \pi \cdot ext{r}_{ ext{Area Centroid}}) \cdot \left( rac{ ext{LSA} + \left( \left( \left( ext{r}_{ ext{Top}} + ext{r}_{ ext{Bottom}} 
ight)^2 
ight) \cdot \pi 
ight)}{2 \cdot \pi \cdot ext{r}_{ ext{Area Centroid}} \cdot ext{R}_{ ext{A/V}}} 
ight)$$

$$\boxed{ \mathbf{ex} } \boxed{ 3990.333 \mathrm{m}^{_{3}} = (2 \cdot \pi \cdot 12 \mathrm{m}) \cdot \left( \frac{2360 \mathrm{m}^{_{2}} + \left( \left( (10 \mathrm{m} + 20 \mathrm{m})^{^{2}} \right) \cdot \pi \right)}{2 \cdot \pi \cdot 12 \mathrm{m} \cdot 1.3 \mathrm{m}^{_{-1}}} \right) }$$



#### Variables Used

- Acurve Area under Curve Solid of Revolution (Square Meter)
- Icurve Curve Length of Solid of Revolution (Meter)
- LSA Lateral Surface Area of Solid of Revolution (Square Meter)
- RAIV Surface to Volume Ratio of Solid of Revolution (1 per Meter)
- rarea Centroid Radius at Area Centroid of Solid of Revolution (Meter)
- rBottom Bottom Radius of Solid of Revolution (Meter)
- rCurve Centroid Radius at Curve Centroid of Solid of Revolution (Meter)
- r<sub>Top</sub> Top Radius of Solid of Revolution (Meter)
- TSA Total Surface Area of Solid of Revolution (Square Meter)
- **V** Volume of Solid of Revolution (*Cubic Meter*)





### Constants, Functions, Measurements used

- Constant: pi, 3.14159265358979323846264338327950288
   Archimedes' constant
- Function: sqrt, sqrt(Number)
   A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- Measurement: Length in Meter (m)
  Length Unit Conversion
- Measurement: Volume in Cubic Meter (m³)

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

  Area Unit Conversion
- Measurement: Reciprocal Length in 1 per Meter (m<sup>-1</sup>)

  Reciprocal Length Unit Conversion





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

- Anticube Formulas
- Antiprism Formulas
- Barrel Formulas
- Bent Cuboid Formulas
- Bicone Formulas
- Capsule Formulas
- Circular Hyperboloid Formulas
- Cuboctahedron Formulas
- Cut Cylinder Formulas
- Cut Cylindrical Shell Formulas
- Cylinder Formulas
- Cylindrical Shell Formulas
- Diagonally Halved Cylinder Formulas
- Disphenoid Formulas
- Double Calotte Formulas
- Double Point Formulas
- Ellipsoid Formulas
- Elliptic Cylinder Formulas
- Elongated Dodecahedron Formulas
- Flat End Cylinder Formulas
- Frustum of Cone Formulas
- Great Dodecahedron Formulas
- Great Icosahedron Formulas 🗗
- Great Stellated Dodecahedron
   Formulas
- Half Cylinder Formulas
- Half Tetrahedron Formulas
- Hemisphere Formulas
- Hollow Cuboid Formulas
- Hollow Cylinder Formulas
- Hollow Frustum Formulas

- Hollow Hemisphere Formulas
- Hollow Pyramid Formulas
- Hollow Sphere Formulas
- Ingot Formulas
- Obelisk Formulas
- Oblique Cylinder Formulas
- Oblique Prism Formulas
- Obtuse Edged Cuboid Formulas
- Oloid Formulas
- Paraboloid Formulas
- Parallelepiped Formulas
- Ramp Formulas
- Regular Bipyramid Formulas
- Rhombohedron Formulas
- Right Wedge Formulas
- Semi Ellipsoid Formulas
- Sharp Bent Cylinder Formulas
- Skewed Three Edged Prism Formulas
- Small Stellated Dodecahedron
   Formulas
- Solid of Revolution Formulas
- Sphere Formulas
- Spherical Cap Formulas
- Spherical Corner Formulas
- Spherical Ring Formulas
- Spherical Sector Formulas
- Spherical Segment Formulas
- Spherical Wedge Formulas
- Square Pillar Formulas
- 🔹 Star Pyramid Formulas 💪
- Stellated Octahedron Formulas





- Toroid Formulas
- Torus Formulas

- Trirectangular Tetrahedron Formulas
- Truncated Rhombohedron Formulas

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