Important Formulas of Toroid and Toroid Sector

List of 17 Important Formulas of Toroid and Toroid Sector

Important Formulas of Toroid and Toroid Sector

Total Surface Area of Toroid

1) Total Surface Area of Toroid

fx $\mathrm{TSA} = (2 \cdot \pi \cdot \mathrm{r} \cdot \mathrm{P}_{\mathrm{Cross\ Section}})$

Open Calculator

ex $1884.956\mathrm{m}^2 = (2 \cdot \pi \cdot 10\mathrm{m} \cdot 30\mathrm{m})$

2) Total Surface Area of Toroid given Volume

fx $\mathrm{TSA} = (2 \cdot \pi \cdot \mathrm{P}_{\mathrm{Cross\ Section}}) \cdot \left(\frac{\mathrm{V}}{2 \cdot \pi \cdot \mathrm{A}_{\mathrm{Cross\ Section}}}\right)$

Open Calculator

ex $1890\mathrm{m}^2 = (2 \cdot \pi \cdot 30\mathrm{m}) \cdot \left(\frac{3150\mathrm{m}^3}{2 \cdot \pi \cdot 50\mathrm{m}^2}\right)$

Volume of Toroid

3) Volume of Toroid

fx $\mathrm{V} = (2 \cdot \pi \cdot \mathrm{r} \cdot \mathrm{A}_{\mathrm{Cross\ Section}})$

Open Calculator

ex $3141.593\mathrm{m}^3 = (2 \cdot \pi \cdot 10\mathrm{m} \cdot 50\mathrm{m}^2)$

4) Volume of Toroid given Total Surface Area

fx $\mathrm{V} = (2 \cdot \pi \cdot \mathrm{A}_{\mathrm{Cross\ Section}}) \cdot \left(\frac{\mathrm{TSA}}{2 \cdot \pi \cdot \mathrm{P}_{\mathrm{Cross\ Section}}}\right)$

Open Calculator

ex $3166.667\mathrm{m}^3 = (2 \cdot \pi \cdot 50\mathrm{m}^2) \cdot \left(\frac{1900\mathrm{m}^2}{2 \cdot \pi \cdot 30\mathrm{m}}\right)$

Cross Sectional Area of Toroid

5) Cross Sectional Area of Toroid

Open Calculator

fx $$A_{\text{Cross Section}} = \left(\frac{V}{2 \cdot \pi \cdot r}\right)$$

ex $$50.13381\text{m}^2 = \left(\frac{3150\text{m}^3}{2 \cdot \pi \cdot 10\text{m}}\right)$$

6) Cross Sectional Area of Toroid given Volume and Total Surface Area

Open Calculator

fx $$A_{\text{Cross Section}} = \left(\frac{V}{2 \cdot \pi \cdot \left(\frac{TSA}{2 \cdot \pi \cdot P_{\text{Cross Section}}}\right)}\right)$$

ex $$49.73684\text{m}^2 = \left(\frac{3150\text{m}^3}{2 \cdot \pi \cdot \left(\frac{1900\text{m}^2}{2 \cdot \pi \cdot 30\text{m}}\right)}\right)$$

Cross Sectional Perimeter of Toroid

7) Cross Sectional Perimeter of Toroid

Open Calculator

fx $$P_{\text{Cross Section}} = \left(\frac{TSA}{2 \cdot \pi \cdot r}\right)$$

ex $$30.23944\text{m} = \left(\frac{1900\text{m}^2}{2 \cdot \pi \cdot 10\text{m}}\right)$$

8) Cross Sectional Perimeter of Toroid given Total Surface Area and Volume

Open Calculator

fx $$P_{\text{Cross Section}} = \left(\frac{TSA}{2 \cdot \pi \cdot \left(\frac{V}{2 \cdot \pi \cdot A_{\text{Cross Section}}}\right)}\right)$$

ex $$30.15873\text{m} = \left(\frac{1900\text{m}^2}{2 \cdot \pi \cdot \left(\frac{3150\text{m}^3}{2 \cdot \pi \cdot 50\text{m}^2}\right)}\right)$$

Radius of Toroid

9) Radius of Toroid

Open Calculator

fx $$r = \left(\frac{TSA}{2 \cdot \pi \cdot P_{\text{Cross Section}}}\right)$$

ex $$10.07981\text{m} = \left(\frac{1900\text{m}^2}{2 \cdot \pi \cdot 30\text{m}}\right)$$

10) Radius of Toroid given Volume

Open Calculator

fx $$r = \left(\frac{V}{2 \cdot \pi \cdot A_{\text{Cross Section}}}\right)$$

ex $$10.02676\text{m} = \left(\frac{3150\text{m}^3}{2 \cdot \pi \cdot 50\text{m}^2}\right)$$

Toroid Sector

11) Cross Sectional Area of Toroid given Total Surface Area of Toroid Sector

Open Calculator

fx $$A_{\text{Cross Section}} = \left(\frac{TSA_{\text{Sector}} - \left(2 \cdot \pi \cdot r \cdot P_{\text{Cross Section}} \cdot \left(\frac{\angle_{\text{Intersection}}}{2 \cdot \pi}\right)\right)}{2}\right)$$

ex $$53.7611\text{m}^2 = \left(\frac{1050\text{m}^2 - \left(2 \cdot \pi \cdot 10\text{m} \cdot 30\text{m} \cdot \left(\frac{180^\circ}{2 \cdot \pi}\right)\right)}{2}\right)$$

12) Cross Sectional Area of Toroid given Volume of Toroid Sector

Open Calculator

fx $$A_{\text{Cross Section}} = \left(\frac{V_{\text{Sector}}}{2 \cdot \pi \cdot r \cdot \left(\frac{\angle_{\text{Intersection}}}{2 \cdot \pi}\right)}\right)$$

ex $$49.97465\text{m}^2 = \left(\frac{1570\text{m}^3}{2 \cdot \pi \cdot 10\text{m} \cdot \left(\frac{180^\circ}{2 \cdot \pi}\right)}\right)$$

13) Cross Sectional Perimeter of Toroid given Total Surface Area of Toroid Sector

Open Calculator

fx $$P_{\text{Cross Section}} = \frac{TSA_{\text{Sector}} - (2 \cdot A_{\text{Cross Section}})}{2 \cdot \pi \cdot r \cdot \left(\frac{\angle_{\text{Intersection}}}{2 \cdot \pi}\right)}$$

ex $$30.23944\text{m} = \frac{1050\text{m}^2 - (2 \cdot 50\text{m}^2)}{2 \cdot \pi \cdot 10\text{m} \cdot \left(\frac{180°}{2 \cdot \pi}\right)}$$

14) Total Surface Area of Toroid Sector

Open Calculator

fx $$TSA_{\text{Sector}} = \left((2 \cdot \pi \cdot r \cdot P_{\text{Cross Section}}) \cdot \left(\frac{\angle_{\text{Intersection}}}{2 \cdot \pi}\right)\right) + (2 \cdot A_{\text{Cross Section}})$$

ex $$1042.478\text{m}^2 = \left((2 \cdot \pi \cdot 10\text{m} \cdot 30\text{m}) \cdot \left(\frac{180°}{2 \cdot \pi}\right)\right) + (2 \cdot 50\text{m}^2)$$

15) Total Surface Area of Toroid Sector given Volume

Open Calculator

fx $$TSA_{\text{Sector}} = \left((2 \cdot \pi \cdot P_{\text{Cross Section}}) \cdot \left(\left(\frac{V_{\text{Sector}}}{2 \cdot \pi \cdot A_{\text{Cross Section}}}\right)\right)\right) + (2 \cdot A_{\text{Cross Section}})$$

ex $$1042\text{m}^2 = \left((2 \cdot \pi \cdot 30\text{m}) \cdot \left(\left(\frac{1570\text{m}^3}{2 \cdot \pi \cdot 50\text{m}^2}\right)\right)\right) + (2 \cdot 50\text{m}^2)$$

16) Volume of Toroid Sector

Open Calculator

fx $$V_{\text{Sector}} = (2 \cdot \pi \cdot r \cdot A_{\text{Cross Section}}) \cdot \left(\frac{\angle_{\text{Intersection}}}{2 \cdot \pi}\right)$$

ex $$1570.796\text{m}^3 = (2 \cdot \pi \cdot 10\text{m} \cdot 50\text{m}^2) \cdot \left(\frac{180°}{2 \cdot \pi}\right)$$

17) Volume of Toroid Sector given Total Surface Area

fx **Open Calculator**

$$V_{Sector} = (2 \cdot \pi \cdot A_{Cross\ Section}) \cdot \left(\left(\frac{TSA_{Sector} - (2 \cdot A_{Cross\ Section})}{2 \cdot \pi \cdot P_{Cross\ Section}} \right) \right)$$

ex

$$1583.333\text{m}^3 = (2 \cdot \pi \cdot 50\text{m}^2) \cdot \left(\left(\frac{1050\text{m}^2 - (2 \cdot 50\text{m}^2)}{2 \cdot \pi \cdot 30\text{m}} \right) \right)$$

Variables Used

- $\angle_{Intersection}$ Angle of Intersection of Toroid Sector *(Degree)*
- $A_{Cross\ Section}$ Cross Sectional Area of Toroid *(Square Meter)*
- $P_{Cross\ Section}$ Cross Sectional Perimeter of Toroid *(Meter)*
- **r** Radius of Toroid *(Meter)*
- **TSA** Total Surface Area of Toroid *(Square Meter)*
- TSA_{Sector} Total Surface Area of Toroid Sector *(Square Meter)*
- **V** Volume of Toroid *(Cubic Meter)*
- V_{Sector} Volume of Toroid Sector *(Cubic Meter)*

Constants, Functions, Measurements used

- Constant: **pi**, 3.14159265358979323846264338327950288
  Archimedes' constant
- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Volume** in Cubic Meter (m^3)
  Volume Unit Conversion
- Measurement: **Area** in Square Meter (m^2)
  Area Unit Conversion
- Measurement: **Angle** in Degree (°)
  Angle 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
- Prismatoid 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
- Spherical Zone Formulas
- Square Pillar Formulas
- Star Pyramid Formulas
- Stellated Octahedron Formulas
- Toroid Formulas
- Torus Formulas
- Trirectangular Tetrahedron Formulas
- Truncated Rhombohedron Formulas

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