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Important Formulas of Hollow Sphere

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List of 15 Important Formulas of Hollow Sphere

Important Formulas of Hollow Sphere

Radius of Hollow Sphere

1) Inner Radius of Hollow Sphere given Surface Area

Open Calculator

fx $$r_{Inner} = \sqrt{\frac{SA}{4 \cdot \pi} - r_{Outer}^2}$$

ex $$5.93984\text{m} = \sqrt{\frac{1700\text{m}^2}{4 \cdot \pi} - (10\text{m})^2}$$

2) Inner Radius of Hollow Sphere given Thickness

Open Calculator

fx $$r_{Inner} = r_{Outer} - t$$

ex $$6\text{m} = 10\text{m} - 4\text{m}$$

3) Inner Radius of Hollow Sphere given Volume

Open Calculator

fx $$r_{Inner} = \left(r_{Outer}^3 - \frac{3 \cdot V}{4 \cdot \pi}\right)^{\frac{1}{3}}$$

ex $$5.964447\text{m} = \left((10\text{m})^3 - \frac{3 \cdot 3300\text{m}^3}{4 \cdot \pi}\right)^{\frac{1}{3}}$$

4) Outer Radius of Hollow Sphere given Surface Area

Open Calculator

fx $$r_{Outer} = \sqrt{\frac{SA}{4 \cdot \pi} - r_{Inner}^2}$$

ex $$9.96402\text{m} = \sqrt{\frac{1700\text{m}^2}{4 \cdot \pi} - (6\text{m})^2}$$

5) Outer Radius of Hollow Sphere given Thickness

Open Calculator

fx $$r_{Outer} = r_{Inner} + t$$

ex $$10\text{m} = 6\text{m} + 4\text{m}$$

6) Outer Radius of Hollow Sphere given Volume

Open Calculator

fx $$r_{Outer} = \left(\frac{3 \cdot V}{4 \cdot \pi} + r_{Inner}^3\right)^{\frac{1}{3}}$$

ex $$10.01271\text{m} = \left(\frac{3 \cdot 3300\text{m}^3}{4 \cdot \pi} + (6\text{m})^3\right)^{\frac{1}{3}}$$

Surface Area of Hollow Sphere

7) Surface Area of Hollow Sphere

Open Calculator

fx $$SA = 4 \cdot \pi \cdot \left(r_{Outer}^2 + r_{Inner}^2\right)$$

ex $$1709.026\text{m}^2 = 4 \cdot \pi \cdot \left((10\text{m})^2 + (6\text{m})^2\right)$$

8) Surface Area of Hollow Sphere given Thickness and Outer Radius

Open Calculator

fx $$SA = 4 \cdot \pi \cdot \left(r_{Outer}^2 + \left(r_{Outer} - t \right)^2 \right)$$

ex $$1709.026\text{m}^2 = 4 \cdot \pi \cdot \left((10\text{m})^2 + (10\text{m} - 4\text{m})^2 \right)$$

9) Surface Area of Hollow Sphere given Volume and Inner Radius

Open Calculator

fx $$SA = 4 \cdot \pi \cdot \left(\left(\frac{3 \cdot V}{4 \cdot \pi} + r_{Inner}^3 \right)^{\frac{2}{3}} + r_{Inner}^2 \right)$$

ex $$1712.222\text{m}^2 = 4 \cdot \pi \cdot \left(\left(\frac{3 \cdot 3300\text{m}^3}{4 \cdot \pi} + (6\text{m})^3 \right)^{\frac{2}{3}} + (6\text{m})^2 \right)$$

Thickness of Hollow Sphere

10) Thickness of Hollow Sphere

Open Calculator

fx $$t = r_{Outer} - r_{Inner}$$

ex $$4\text{m} = 10\text{m} - 6\text{m}$$

11) Thickness of Hollow Sphere given Surface Area and Inner Radius

Open Calculator

fx $$t = \sqrt{\frac{SA}{4 \cdot \pi} - r_{Inner}^2} - r_{Inner}$$

ex $$3.96402\text{m} = \sqrt{\frac{1700\text{m}^2}{4 \cdot \pi} - (6\text{m})^2} - 6\text{m}$$

12) Thickness of Hollow Sphere given Volume and Outer Radius

Open Calculator

fx $$t = r_{Outer} - \left(r_{Outer}^3 - \frac{3 \cdot V}{4 \cdot \pi}\right)^{\frac{1}{3}}$$

ex $$4.035553\text{m} = 10\text{m} - \left((10\text{m})^3 - \frac{3 \cdot 3300\text{m}^3}{4 \cdot \pi}\right)^{\frac{1}{3}}$$

Volume of Hollow Sphere

13) Volume of Hollow Sphere

Open Calculator

fx $$V = \frac{4}{3} \cdot \pi \cdot \left(r_{Outer}^3 - r_{Inner}^3\right)$$

ex $$3284.012\text{m}^3 = \frac{4}{3} \cdot \pi \cdot \left((10\text{m})^3 - (6\text{m})^3\right)$$

14) Volume of Hollow Sphere given Surface Area and Outer Radius

Open Calculator

fx $$V = \frac{4}{3} \cdot \pi \cdot \left(r_{Outer}^3 - \left(\frac{SA}{4 \cdot \pi} - r_{Outer}^2\right)^{\frac{3}{2}}\right)$$

ex $$3310.955\text{m}^3 = \frac{4}{3} \cdot \pi \cdot \left((10\text{m})^3 - \left(\frac{1700\text{m}^2}{4 \cdot \pi} - (10\text{m})^2\right)^{\frac{3}{2}}\right)$$

15) Volume of Hollow Sphere given Thickness and Inner Radius

Open Calculator

fx $$V = \frac{4}{3} \cdot \pi \cdot \left(\left(r_{Inner} + t \right)^3 - r_{Inner}^3 \right)$$

ex $$3284.012\text{m}^3 = \frac{4}{3} \cdot \pi \cdot \left(\left(6\text{m} + 4\text{m} \right)^3 - \left(6\text{m} \right)^3 \right)$$

Variables Used

- r_{Inner} Inner Radius of Hollow Sphere *(Meter)*
- r_{Outer} Outer Radius of Hollow Sphere *(Meter)*
- **SA** Surface Area of Hollow Sphere *(Square Meter)*
- **t** Thickness of Hollow Sphere *(Meter)*
- **V** Volume of Hollow Sphere *(Cubic 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: **Volume** in Cubic Meter (m^3)
  Volume Unit Conversion
- Measurement: **Area** in Square Meter (m^2)
  Area Unit Conversion

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- 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
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- Parallelepiped Formulas
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- Small Stellated Dodecahedron Formulas
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- Spherical Wedge Formulas
- Spherical Zone Formulas
- Square Pillar Formulas
- Star Pyramid Formulas
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- Toroid Formulas
- Torus Formulas
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- Truncated Rhombohedron Formulas

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