Important Formulas of Hollow Hemisphere PDF

Formulas
Examples
with Units

List of 11
Important Formulas of Hollow Hemisphere

1) Radius of Hollow Hemisphere Formulas

1.1) Inner Radius of Hollow Hemisphere Formula

Evaluate Formula

Formula

$$r_{Inner} = r_{Outer} - t_{Shell}$$

Example with Units

$$10\,\text{m} = 12\,\text{m} - 2\,\text{m}$$

1.2) Outer Radius of Hollow Hemisphere Formula

Evaluate Formula

Formula

$$r_{Outer} = t_{Shell} + r_{Inner}$$

Example with Units

$$12\,\text{m} = 2\,\text{m} + 10\,\text{m}$$

2) Shell Thickness of Hollow Hemisphere Formulas

2.1) Shell Thickness of Hollow Hemisphere Formula

Evaluate Formula

Formula

$$t_{Shell} = r_{Outer} - r_{Inner}$$

Example with Units

$$2\,\text{m} = 12\,\text{m} - 10\,\text{m}$$

2.2) Shell Thickness of Hollow Hemisphere given Total Surface Area and Inner Radius Formula

Evaluate Formula

Formula

$$t_{Shell} = \sqrt{\frac{1}{3}\cdot\left(\frac{TSA}{\pi} - r_{Inner}^{2}\right)} - r_{Inner}$$

Example with Units

$$1.9941\,\text{m} = \sqrt{\frac{1}{3}\cdot\left(\frac{1670\,\text{m}^2}{3.1416} - 10\,\text{m}^{2}\right)} - 10\,\text{m}$$

2.3) Shell Thickness of Hollow Hemisphere given Volume and Outer Radius Formula

Evaluate Formula

Formula

$$t_{Shell} = r_{Outer} - \left(r_{Outer}^{3} - \frac{3\cdot V}{2\cdot\pi}\right)^{\frac{1}{3}}$$

Example with Units

$$2.0004\,\text{m} = 12\,\text{m} - \left(12\,\text{m}^{3} - \frac{3\cdot 1525\,\text{m}^3}{2\cdot 3.1416}\right)^{\frac{1}{3}}$$

3) Total Surface Area of Hollow Hemisphere Formulas

3.1) Total Surface Area of Hollow Hemisphere Formula

Evaluate Formula

Formula

$$TSA = \pi \cdot \left(\left(2 \cdot \left(r_{Outer}^{2} + r_{Inner}^{2} \right) \right) + \left(r_{Outer}^{2} - r_{Inner}^{2} \right) \right)$$

Example with Units

$$1671.3273\,\text{m}^2 = 3.1416 \cdot \left(\left(2 \cdot \left(12\,\text{m}^{2} + 10\,\text{m}^{2} \right) \right) + \left(12\,\text{m}^{2} - 10\,\text{m}^{2} \right) \right)$$

3.2) Total Surface Area of Hollow Hemisphere given Shell Thickness and Outer Radius Formula

Evaluate Formula

Formula

$$TSA = \pi \cdot \left(3 \cdot r_{Outer}^{2} + \left(r_{Outer} - t_{Shell} \right)^{2} \right)$$

Example with Units

$$1671.3273\,\text{m}^2 = 3.1416 \cdot \left(3 \cdot 12\,\text{m}^{2} + \left(12\,\text{m} - 2\,\text{m} \right)^{2} \right)$$

3.3) Total Surface Area of Hollow Hemisphere given Volume and Inner Radius Formula

Evaluate Formula

Formula

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

Example with Units

$$1671.3974\,\text{m}^2 = 3.1416 \cdot \left(3 \cdot \left(\frac{3 \cdot 1525\,\text{m}^3}{2 \cdot 3.1416} + 10\,\text{m}^{3} \right)^{\frac{2}{3}} + 10\,\text{m}^{2} \right)$$

4) Volume of Hollow Hemisphere Formulas

4.1) Volume of Hollow Hemisphere Formula

Evaluate Formula

Formula

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

Example with Units

$$1524.7196\,\text{m}^3 = \frac{2}{3} \cdot 3.1416 \cdot \left(12\,\text{m}^{3} - 10\,\text{m}^{3} \right)$$

4.2) Volume of Hollow Hemisphere given Shell Thickness and Inner Radius Formula

Evaluate Formula

Formula

$$V = \frac{2}{3} \cdot \pi \cdot \left(\left(t_{Shell} + r_{Inner} \right)^3 - r_{Inner}^3 \right)$$

Example with Units

$$1524.7196\,m^3 = \frac{2}{3} \cdot 3.1416 \cdot \left(\left(2\,m + 10\,m \right)^3 - 10\,m^3 \right)$$

4.3) Volume of Hollow Hemisphere given Total Surface Area and Outer Radius Formula

Evaluate Formula

Formula

$$V = \frac{2}{3} \cdot \pi \cdot \left(r_{Outer}^3 - \left(\sqrt{\left(\frac{TSA}{\pi} \right) - \left(3 \cdot r_{Outer}^2 \right)} \right)^3 \right)$$

Example with Units

$$1537.9785\,m^3 = \frac{2}{3} \cdot 3.1416 \cdot \left(12\,m^3 - \left(\sqrt{\left(\frac{1670\,m^2}{3.1416} \right) - \left(3 \cdot 12\,m^2 \right)} \right)^3 \right)$$

Variables used in list of Important Formulas of Hollow Hemisphere above

- r_{Inner} Inner Radius of Hollow Hemisphere *(Meter)*
- r_{Outer} Outer Radius of Hollow Hemisphere *(Meter)*
- t_{Shell} Shell Thickness of Hollow Hemisphere *(Meter)*
- **TSA** Total Surface Area of Hollow Hemisphere *(Square Meter)*
- **V** Volume of Hollow Hemisphere *(Cubic Meter)*

Constants, Functions, Measurements used in list of Important Formulas of Hollow Hemisphere above

- constant(s): **pi**, 3.14159265358979323846264338327950288 *Archimedes' constant*
- Functions: **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 (m^3) *Volume Unit Conversion*
- Measurement: **Area** in Square Meter (m^2) *Area Unit Conversion*

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- Important Hollow Frustum Formulas
- Important Hollow Hemisphere Formulas
- Important Hollow Pyramid Formulas
- Important Hollow Sphere Formulas
- Important Ingot Formulas
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- Important Spherical Corner Formulas
- Important Spherical Ring Formulas
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