

Important Formulas of Cylindrical Shell PDF



Formulas Examples with Units

List of 14 Important Formulas of Cylindrical Shell

1) Height of Cylindrical Shell given Lateral Surface Area Formula ↻

Formula

$$h = \frac{LSA}{2 \cdot \pi \cdot (r_{Outer} + r_{Inner})}$$

Example with Units

$$4.9931\text{m} = \frac{530\text{m}^2}{2 \cdot 3.1416 \cdot (10\text{m} + 7\text{m})}$$

Evaluate Formula ↻

2) Height of Cylindrical Shell given Volume Formula ↻

Formula

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

Example with Units

$$4.9931\text{m} = \frac{800\text{m}^3}{3.1416 \cdot (10\text{m}^2 - 7\text{m}^2)}$$

Evaluate Formula ↻

3) Inner Radius of Cylindrical Shell Formula ↻

Formula

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

Example with Units

$$7\text{m} = 10\text{m} - 3\text{m}$$

Evaluate Formula ↻

4) Inner Radius of Cylindrical Shell given Lateral Surface Area Formula ↻

Formula

$$r_{Inner} = \frac{LSA}{2 \cdot \pi \cdot h} - r_{Outer}$$

Example with Units

$$6.8704\text{m} = \frac{530\text{m}^2}{2 \cdot 3.1416 \cdot 5\text{m}} - 10\text{m}$$

Evaluate Formula ↻

5) Lateral Surface Area of Cylindrical Shell Formula ↻

Formula

$$LSA = 2 \cdot \pi \cdot h \cdot (r_{Outer} + r_{Inner})$$

Example with Units

$$534.0708\text{m}^2 = 2 \cdot 3.1416 \cdot 5\text{m} \cdot (10\text{m} + 7\text{m})$$

Evaluate Formula ↻

6) Outer Radius of Cylindrical Shell Formula ↻

Formula

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

Example with Units

$$10\text{m} = 3\text{m} + 7\text{m}$$

Evaluate Formula ↻



7) Outer Radius of Cylindrical Shell given Lateral Surface Area Formula

Formula

$$r_{\text{Outer}} = \frac{\text{LSA}}{2 \cdot \pi \cdot h} + r_{\text{Inner}}$$

Example with Units

$$9.8704\text{m} = \frac{530\text{m}^2}{2 \cdot 3.1416 \cdot 5\text{m}} + 7\text{m}$$

Evaluate Formula 

8) Total Surface Area of Cylindrical Shell Formula

Formula

$$\text{TSA} = 2 \cdot \pi \cdot (r_{\text{Outer}} + r_{\text{Inner}}) \cdot (r_{\text{Outer}} - r_{\text{Inner}} + h)$$

Example with Units

$$854.5132\text{m}^2 = 2 \cdot 3.1416 \cdot (10\text{m} + 7\text{m}) \cdot (10\text{m} - 7\text{m} + 5\text{m})$$

Evaluate Formula 

9) Total Surface Area of Cylindrical Shell given Wall Thickness and Outer Radius Formula

Formula

$$\text{TSA} = 2 \cdot \pi \cdot ((2 \cdot r_{\text{Outer}}) - t_{\text{Wall}}) \cdot (t_{\text{Wall}} + h)$$

Example with Units

$$854.5132\text{m}^2 = 2 \cdot 3.1416 \cdot ((2 \cdot 10\text{m}) - 3\text{m}) \cdot (3\text{m} + 5\text{m})$$

Evaluate Formula 

10) Volume of Cylindrical Shell Formula

Formula

$$V = \pi \cdot h \cdot (r_{\text{Outer}}^2 - r_{\text{Inner}}^2)$$

Example with Units

$$801.1061\text{m}^3 = 3.1416 \cdot 5\text{m} \cdot (10\text{m}^2 - 7\text{m}^2)$$

Evaluate Formula 

11) Volume of Cylindrical Shell given Wall Thickness and Inner Radius Formula

Formula

$$V = \pi \cdot h \cdot ((t_{\text{Wall}} + r_{\text{Inner}})^2 - r_{\text{Inner}}^2)$$

Example with Units

$$801.1061\text{m}^3 = 3.1416 \cdot 5\text{m} \cdot ((3\text{m} + 7\text{m})^2 - 7\text{m}^2)$$

Evaluate Formula 

12) Volume of Cylindrical Shell given Wall Thickness and Outer Radius Formula

Formula

$$V = \pi \cdot h \cdot (r_{\text{Outer}}^2 - (r_{\text{Outer}} - t_{\text{Wall}})^2)$$

Example with Units

$$801.1061\text{m}^3 = 3.1416 \cdot 5\text{m} \cdot (10\text{m}^2 - (10\text{m} - 3\text{m})^2)$$

Evaluate Formula 



13) Wall Thickness of Cylindrical Shell Formula

Formula

$$t_{\text{Wall}} = r_{\text{Outer}} - r_{\text{Inner}}$$

Example with Units

$$3 \text{ m} = 10 \text{ m} - 7 \text{ m}$$

Evaluate Formula 

14) Wall Thickness of Cylindrical Shell given Volume and Inner Radius Formula

Formula

$$t_{\text{Wall}} = \sqrt{\frac{V}{\pi \cdot h} + r_{\text{Inner}}^2} - r_{\text{Inner}}$$

Example with Units

$$2.9965 \text{ m} = \sqrt{\frac{800 \text{ m}^3}{3.1416 \cdot 5 \text{ m}} + 7 \text{ m}^2} - 7 \text{ m}$$




Evaluate Formula 



Variables used in list of Important Formulas of Cylindrical Shell above

- **h** Height of Cylindrical Shell (Meter)
- **LSA** Lateral Surface Area of Cylindrical Shell (Square Meter)
- **r_{Inner}** Inner Radius of Cylindrical Shell (Meter)
- **r_{Outer}** Outer Radius of Cylindrical Shell (Meter)
- **t_{Wall}** Wall Thickness of Cylindrical Shell (Meter)
- **TSA** Total Surface Area of Cylindrical Shell (Square Meter)
- **V** Volume of Cylindrical Shell (Cubic Meter)

















Constants, Functions, Measurements used in list of Important Formulas of Cylindrical Shell 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 (m³)
Volume Unit Conversion 
- **Measurement: Area** in Square Meter (m²)
Area Unit Conversion 









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