

Important Formulas of Frustum of Cone PDF



**Formulas
Examples
with Units**

**List of 26
Important Formulas of Frustum of Cone**

1) Height of Frustum of Cone Formulas ↻

1.1) Height of Frustum of Cone given Curved Surface Area Formula ↻

Formula

$$h = \sqrt{\left(\frac{\text{CSA}}{\pi \cdot (r_{\text{Top}} + r_{\text{Base}})}\right)^2 - (r_{\text{Top}} - r_{\text{Base}})^2}$$

Evaluate Formula ↻

Example with Units

$$8.1357 \text{ m} = \sqrt{\left(\frac{450 \text{ m}^2}{3.1416 \cdot (10 \text{ m} + 5 \text{ m})}\right)^2 - (10 \text{ m} - 5 \text{ m})^2}$$

1.2) Height of Frustum of Cone given Slant Height Formula ↻

Formula

$$h = \sqrt{h_{\text{Slant}}^2 - (r_{\text{Top}} - r_{\text{Base}})^2}$$

Example with Units

$$7.4833 \text{ m} = \sqrt{9 \text{ m}^2 - (10 \text{ m} - 5 \text{ m})^2}$$

Evaluate Formula ↻

1.3) Height of Frustum of Cone given Total Surface Area Formula ↻

Formula

$$h = \sqrt{\left(\frac{\text{TSA}}{\pi} - (r_{\text{Top}}^2 + r_{\text{Base}}^2)\right)^2 - (r_{\text{Top}} - r_{\text{Base}})^2}$$

Evaluate Formula ↻

Example with Units

$$8.317 \text{ m} = \sqrt{\left(\frac{850 \text{ m}^2}{3.1416} - (10 \text{ m}^2 + 5 \text{ m}^2)\right)^2 - (10 \text{ m} - 5 \text{ m})^2}$$

1.4) Height of Frustum of Cone given Volume Formula ↻

Formula

$$h = \frac{3 \cdot V}{\pi \cdot (r_{\text{Top}}^2 + r_{\text{Base}}^2 + (r_{\text{Top}} \cdot r_{\text{Base}}))}$$

Example with Units

$$8.1851 \text{ m} = \frac{3 \cdot 1500 \text{ m}^3}{3.1416 \cdot (10 \text{ m}^2 + 5 \text{ m}^2 + (10 \text{ m} \cdot 5 \text{ m}))}$$

Evaluate Formula ↻



2) Radius of Frustum of Cone Formulas ↻

2.1) Base Radius of Frustum of Cone given Base Area Formula ↻

Formula

$$r_{\text{Base}} = \sqrt{\frac{A_{\text{Base}}}{\pi}}$$

Example with Units

$$5.0463 \text{ m} = \sqrt{\frac{80 \text{ m}^2}{3.1416}}$$

Evaluate Formula ↻

2.2) Base Radius of Frustum of Cone given Slant Height Formula ↻

Formula

$$r_{\text{Base}} = r_{\text{Top}} - \sqrt{h_{\text{Slant}}^2 - h^2}$$

Example with Units

$$5.8769 \text{ m} = 10 \text{ m} - \sqrt{9 \text{ m}^2 - 8 \text{ m}^2}$$

Evaluate Formula ↻

2.3) Top Radius of Frustum of Cone given Slant Height and Base Area Formula ↻

Formula

$$r_{\text{Top}} = \sqrt{h_{\text{Slant}}^2 - h^2} + \sqrt{\frac{A_{\text{Base}}}{\pi}}$$

Example with Units

$$9.1694 \text{ m} = \sqrt{9 \text{ m}^2 - 8 \text{ m}^2} + \sqrt{\frac{80 \text{ m}^2}{3.1416}}$$

Evaluate Formula ↻

2.4) Top Radius of Frustum of Cone given Top Area Formula ↻

Formula

$$r_{\text{Top}} = \sqrt{\frac{A_{\text{Top}}}{\pi}}$$

Example with Units

$$10.0134 \text{ m} = \sqrt{\frac{315 \text{ m}^2}{3.1416}}$$

Evaluate Formula ↻

3) Slant Height of Frustum of Cone Formulas ↻

3.1) Slant Height of Frustum of Cone Formula ↻

Formula

$$h_{\text{Slant}} = \sqrt{h^2 + (r_{\text{Top}} - r_{\text{Base}})^2}$$

Example with Units

$$9.434 \text{ m} = \sqrt{8 \text{ m}^2 + (10 \text{ m} - 5 \text{ m})^2}$$

Evaluate Formula ↻

3.2) Slant Height of Frustum of Cone given Curved Surface Area Formula ↻

Formula

$$h_{\text{Slant}} = \frac{\text{CSA}}{\pi \cdot (r_{\text{Top}} + r_{\text{Base}})}$$

Example with Units

$$9.5493 \text{ m} = \frac{450 \text{ m}^2}{3.1416 \cdot (10 \text{ m} + 5 \text{ m})}$$

Evaluate Formula ↻

3.3) Slant Height of Frustum of Cone given Total Surface Area Formula ↻

Formula

$$h_{\text{Slant}} = \frac{\frac{\text{TSA}}{\pi} - (r_{\text{Top}}^2 + r_{\text{Base}}^2)}{r_{\text{Top}} + r_{\text{Base}}}$$

Example with Units

$$9.7042 \text{ m} = \frac{\frac{850 \text{ m}^2}{3.1416} - (10 \text{ m}^2 + 5 \text{ m}^2)}{10 \text{ m} + 5 \text{ m}}$$

Evaluate Formula ↻



3.4) Slant Height of Frustum of Cone given Volume Formula ↻

Evaluate Formula ↻

Formula

$$h_{\text{Slant}} = \sqrt{\left(\frac{3 \cdot V}{\pi \cdot (r_{\text{Top}}^2 + r_{\text{Base}}^2 + (r_{\text{Top}} \cdot r_{\text{Base}}))}\right)^2 + (r_{\text{Top}} - r_{\text{Base}})^2}$$

Example with Units

$$9.5915 \text{ m} = \sqrt{\left(\frac{3 \cdot 1500 \text{ m}^3}{3.1416 \cdot (10 \text{ m}^2 + 5 \text{ m}^2 + (10 \text{ m} \cdot 5 \text{ m}))}\right)^2 + (10 \text{ m} - 5 \text{ m})^2}$$

4) Surface Area of Frustum of Cone Formulas ↻

4.1) Base Area of Frustum of Cone Formula ↻

Evaluate Formula ↻

Formula

$$A_{\text{Base}} = \pi \cdot r_{\text{Base}}^2$$

Example with Units

$$78.5398 \text{ m}^2 = 3.1416 \cdot 5 \text{ m}^2$$

4.2) Curved Surface Area of Frustum of Cone Formula ↻

Evaluate Formula ↻

Formula

$$CSA = \pi \cdot (r_{\text{Top}} + r_{\text{Base}}) \cdot \sqrt{(r_{\text{Top}} - r_{\text{Base}})^2 + h^2}$$

Example with Units

$$444.5659 \text{ m}^2 = 3.1416 \cdot (10 \text{ m} + 5 \text{ m}) \cdot \sqrt{(10 \text{ m} - 5 \text{ m})^2 + 8 \text{ m}^2}$$

4.3) Curved Surface Area of Frustum of Cone given Slant Height Formula ↻

Evaluate Formula ↻

Formula

$$CSA = \pi \cdot (r_{\text{Top}} + r_{\text{Base}}) \cdot h_{\text{Slant}}$$

Example with Units

$$424.115 \text{ m}^2 = 3.1416 \cdot (10 \text{ m} + 5 \text{ m}) \cdot 9 \text{ m}$$

4.4) Curved Surface Area of Frustum of Cone given Total Surface Area Formula ↻

Evaluate Formula ↻

Formula

$$CSA = TSA - \left(\pi \cdot (r_{\text{Top}}^2 + r_{\text{Base}}^2)\right)$$

Example with Units

$$457.3009 \text{ m}^2 = 850 \text{ m}^2 - \left(3.1416 \cdot (10 \text{ m}^2 + 5 \text{ m}^2)\right)$$

4.5) Curved Surface Area of Frustum of Cone given Volume Formula ↻

Evaluate Formula ↻

Formula

$$CSA = \pi \cdot (r_{\text{Top}} + r_{\text{Base}}) \cdot \sqrt{\left(\frac{3 \cdot V}{\pi \cdot (r_{\text{Top}}^2 + r_{\text{Base}}^2 + (r_{\text{Top}} \cdot r_{\text{Base}}))}\right)^2 + (r_{\text{Top}} - r_{\text{Base}})^2}$$

Example with Units

$$451.9868 \text{ m}^2 = 3.1416 \cdot (10 \text{ m} + 5 \text{ m}) \cdot \sqrt{\left(\frac{3 \cdot 1500 \text{ m}^3}{3.1416 \cdot (10 \text{ m}^2 + 5 \text{ m}^2 + (10 \text{ m} \cdot 5 \text{ m}))}\right)^2 + (10 \text{ m} - 5 \text{ m})^2}$$



4.6) Top Area of Frustum of Cone Formula

Formula

$$A_{\text{Top}} = \pi \cdot r_{\text{Top}}^2$$

Example with Units

$$314.1593 \text{ m}^2 = 3.1416 \cdot 10 \text{ m}^2$$

Evaluate Formula 

4.7) Total Surface Area of Frustum of Cone Formula

Formula

$$\text{TSA} = \pi \cdot \left(\left((r_{\text{Top}} + r_{\text{Base}}) \cdot \sqrt{(r_{\text{Top}} - r_{\text{Base}})^2 + h^2} \right) + r_{\text{Top}}^2 + r_{\text{Base}}^2 \right)$$

Example with Units

$$837.265 \text{ m}^2 = 3.1416 \cdot \left(\left((10 \text{ m} + 5 \text{ m}) \cdot \sqrt{(10 \text{ m} - 5 \text{ m})^2 + 8 \text{ m}^2} \right) + 10 \text{ m}^2 + 5 \text{ m}^2 \right)$$

Evaluate Formula 

4.8) Total Surface Area of Frustum of Cone given Curved Surface Area Formula

Formula

$$\text{TSA} = \text{CSA} + \left(\pi \cdot (r_{\text{Top}}^2 + r_{\text{Base}}^2) \right)$$

Example with Units

$$842.6991 \text{ m}^2 = 450 \text{ m}^2 + \left(3.1416 \cdot (10 \text{ m}^2 + 5 \text{ m}^2) \right)$$

Evaluate Formula 

4.9) Total Surface Area of Frustum of Cone given Slant Height Formula

Formula

$$\text{TSA} = \pi \cdot \left(\left((r_{\text{Top}} + r_{\text{Base}}) \cdot h_{\text{Slant}} \right) + r_{\text{Top}}^2 + r_{\text{Base}}^2 \right)$$

Example with Units

$$816.8141 \text{ m}^2 = 3.1416 \cdot \left(\left((10 \text{ m} + 5 \text{ m}) \cdot 9 \text{ m} \right) + 10 \text{ m}^2 + 5 \text{ m}^2 \right)$$

Evaluate Formula 

4.10) Total Surface Area of Frustum of Cone given Volume Formula

Formula

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

Example with Units

$$844.6858 \text{ m}^2 = 3.1416 \cdot \left(\left((10 \text{ m} + 5 \text{ m}) \cdot \sqrt{\left(\frac{3 \cdot 1500 \text{ m}^3}{3.1416 \cdot (10 \text{ m}^2 + 5 \text{ m}^2 + (10 \text{ m} \cdot 5 \text{ m}))} \right)^2 + (10 \text{ m} - 5 \text{ m})^2} \right) + 10 \text{ m}^2 + 5 \text{ m}^2 \right)$$

Evaluate Formula 



5) Volume of Frustum of Cone Formulas

5.1) Volume of Frustum of Cone Formula

Formula

$$V = \frac{1}{3} \cdot \pi \cdot h \cdot \left(r_{\text{Top}}^2 + r_{\text{Base}}^2 + (r_{\text{Top}} \cdot r_{\text{Base}}) \right)$$

Evaluate Formula

Example with Units

$$1466.0766 \text{ m}^3 = \frac{1}{3} \cdot 3.1416 \cdot 8 \text{ m} \cdot \left(10 \text{ m}^2 + 5 \text{ m}^2 + (10 \text{ m} \cdot 5 \text{ m}) \right)$$

5.2) Volume of Frustum of Cone given Curved Surface Area Formula

Formula

$$V = \frac{1}{3} \cdot \pi \cdot \sqrt{\left(\frac{\text{CSA}}{\pi \cdot (r_{\text{Top}} + r_{\text{Base}})} \right)^2 - (r_{\text{Top}} - r_{\text{Base}})^2} \cdot \left(r_{\text{Top}}^2 + r_{\text{Base}}^2 + (r_{\text{Top}} \cdot r_{\text{Base}}) \right)$$

Evaluate Formula

Example with Units

$$1490.9387 \text{ m}^3 = \frac{1}{3} \cdot 3.1416 \cdot \sqrt{\left(\frac{450 \text{ m}^2}{3.1416 \cdot (10 \text{ m} + 5 \text{ m})} \right)^2 - (10 \text{ m} - 5 \text{ m})^2} \cdot \left(10 \text{ m}^2 + 5 \text{ m}^2 + (10 \text{ m} \cdot 5 \text{ m}) \right)$$

5.3) Volume of Frustum of Cone given Slant Height Formula

Formula

$$V = \frac{\pi \cdot \sqrt{h_{\text{Slant}}^2 - (r_{\text{Top}} - r_{\text{Base}})^2}}{3} \cdot \left(r_{\text{Top}}^2 + r_{\text{Base}}^2 + (r_{\text{Top}} \cdot r_{\text{Base}}) \right)$$

Evaluate Formula

Example with Units

$$1371.3891 \text{ m}^3 = \frac{3.1416 \cdot \sqrt{9 \text{ m}^2 - (10 \text{ m} - 5 \text{ m})^2}}{3} \cdot \left(10 \text{ m}^2 + 5 \text{ m}^2 + (10 \text{ m} \cdot 5 \text{ m}) \right)$$

5.4) Volume of Frustum of Cone given Total Surface Area Formula

Formula

$$V = \frac{1}{3} \cdot \pi \cdot \sqrt{\left(\frac{\text{TSA} - (r_{\text{Top}}^2 + r_{\text{Base}}^2)}{\pi} \right)^2 - (r_{\text{Top}} - r_{\text{Base}})^2} \cdot \left(r_{\text{Top}}^2 + r_{\text{Base}}^2 + (r_{\text{Top}} \cdot r_{\text{Base}}) \right)$$

Evaluate Formula

Example with Units




$$1524.1647 \text{ m}^3 = \frac{1}{3} \cdot 3.1416 \cdot \sqrt{\left(\frac{850 \text{ m}^2 - (10 \text{ m}^2 + 5 \text{ m}^2)}{3.1416} \right)^2 - (10 \text{ m} - 5 \text{ m})^2} \cdot \left(10 \text{ m}^2 + 5 \text{ m}^2 + (10 \text{ m} \cdot 5 \text{ m}) \right)$$



Variables used in list of Important Formulas of Frustum of Cone above

- **A_{Base}** Base Area of Frustum of Cone (Square Meter)
- **A_{Top}** Top Area of Frustum of Cone (Square Meter)
- **CSA** Curved Surface Area of Frustum of Cone (Square Meter)
- **h** Height of Frustum of Cone (Meter)
- **h_{Slant}** Slant Height of Frustum of Cone (Meter)
- **r_{Base}** Base Radius of Frustum of Cone (Meter)
- **r_{Top}** Top Radius of Frustum of Cone (Meter)
- **TSA** Total Surface Area of Frustum of Cone (Square Meter)
- **V** Volume of Frustum of Cone (Cubic Meter)

Constants, Functions, Measurements used in list of Important Formulas of Frustum of Cone 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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