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Truncated Cone Formulas

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List of 29 Truncated Cone Formulas

Truncated Cone

Height of Truncated Cone

1) Height of Truncated Cone given Curved Surface Area

Open Calculator

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

ex $$7.124522\text{m} = \sqrt{\left(\frac{170\text{m}^2}{\pi \cdot (5\text{m} + 2\text{m})}\right)^2 - (5\text{m} - 2\text{m})^2}$$

2) Height of Truncated Cone given Slant Height

Open Calculator

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

ex $$7.416198\text{m} = \sqrt{(8\text{m})^2 - (5\text{m} - 2\text{m})^2}$$

3) Height of Truncated Cone given Total Surface Area

Open Calculator

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

ex $$7.069912\text{m} = \sqrt{\left(\frac{260\text{m}^2 - \pi \cdot \left((5\text{m})^2 + (2\text{m})^2\right)}{\pi \cdot (5\text{m} + 2\text{m})}\right)^2 - (5\text{m} - 2\text{m})^2}$$

4) Height of Truncated Cone given Volume

Open Calculator

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

ex $$7.100759\text{m} = \frac{3 \cdot 290\text{m}^3}{\pi \cdot \left((5\text{m})^2 + (5\text{m} \cdot 2\text{m}) + (2\text{m})^2\right)}$$

Radius of Truncated Cone

Base Radius of Truncated Cone

5) Base Radius of Truncated Cone given Base Area

Open Calculator

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

$$5.046265\text{m} = \sqrt{\frac{80\text{m}^2}{\pi}}$$

6) Base Radius of Truncated Cone given Slant Height

Open Calculator

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

$$5.872983\text{m} = 2\text{m} + \sqrt{(8\text{m})^2 - (7\text{m})^2}$$

Top Radius of Truncated Cone

7) Top Radius of Truncated Cone given Slant Height

Open Calculator

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

$$1.127017\text{m} = 5\text{m} - \sqrt{(8\text{m})^2 - (7\text{m})^2}$$

8) Top Radius of Truncated Cone given Top Area

Open Calculator

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

$$1.95441\text{m} = \sqrt{\frac{12\text{m}^2}{\pi}}$$

Slant Height of Truncated Cone

9) Slant Height of Truncated Cone

Open Calculator

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

$$7.615773\text{m} = \sqrt{(5\text{m} - 2\text{m})^2 + (7\text{m})^2}$$

10) Slant Height of Truncated Cone given Curved Surface Area

Open Calculator

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

ex $$7.730383\text{m} = \frac{170\text{m}^2}{\pi \cdot (5\text{m} + 2\text{m})}$$

11) Slant Height of Truncated Cone given Total Surface Area

Open Calculator

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

ex $$7.680081\text{m} = \frac{260\text{m}^2 - \pi \cdot \left((5\text{m})^2 + (2\text{m})^2\right)}{\pi \cdot (5\text{m} + 2\text{m})}$$

12) Slant Height of Truncated Cone given Volume

Open Calculator

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

ex $$7.708487\text{m} = \sqrt{\left(\frac{3 \cdot 290\text{m}^3}{\pi \cdot \left((5\text{m})^2 + (5\text{m} \cdot 2\text{m}) + (2\text{m})^2\right)}\right)^2 + (5\text{m} - 2\text{m})^2}$$

Surface Area of Truncated Cone

Base Area of Truncated Cone

13) Base Area of Truncated Cone

Open Calculator

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

ex $$78.53982\text{m}^2 = \pi \cdot (5\text{m})^2$$

Curved Surface Area of Truncated Cone

14) Curved Surface Area of Truncated Cone

Open Calculator

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

ex $$167.4796\mathrm{m^2} = \pi \cdot (5\mathrm{m} + 2\mathrm{m}) \cdot \sqrt{(5\mathrm{m} - 2\mathrm{m})^2 + (7\mathrm{m})^2}$$

15) Curved Surface Area of Truncated Cone given Slant Height

Open Calculator

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

ex $$175.9292\mathrm{m^2} = \pi \cdot (5\mathrm{m} + 2\mathrm{m}) \cdot 8\mathrm{m}$$

16) Curved Surface Area of Truncated Cone given Total Surface Area

Open Calculator

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

ex $$168.8938\mathrm{m^2} = 260\mathrm{m^2} - \pi \cdot \left((5\mathrm{m})^2 + (2\mathrm{m})^2\right)$$

17) Curved Surface Area of Truncated Cone given Volume

Open Calculator

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

ex $$169.5185\mathrm{m^2} = \pi \cdot (5\mathrm{m} + 2\mathrm{m}) \cdot \sqrt{(5\mathrm{m} - 2\mathrm{m})^2 + \left(\frac{3 \cdot 290\mathrm{m^3}}{\pi \cdot \left((5\mathrm{m})^2 + (5\mathrm{m} \cdot 2\mathrm{m}) + (2\mathrm{m})^2\right)}\right)^2}$$

Top Area of Truncated Cone

18) Top Area of Truncated Cone

Open Calculator

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

ex $$12.56637\mathrm{m^2} = \pi \cdot (2\mathrm{m})^2$$

Total Surface Area of Truncated Cone

19) Total Surface Area of Truncated Cone

Open Calculator

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

ex $$258.5858\text{m}^2 = \pi \cdot \left((5\text{m})^2 + (2\text{m})^2 + \left(\sqrt{(2\text{m} - 5\text{m})^2 + (7\text{m})^2} \cdot (5\text{m} + 2\text{m}) \right) \right)$$

20) Total Surface Area of Truncated Cone given Curved Surface Area

Open Calculator

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

ex $$261.1062\text{m}^2 = 170\text{m}^2 + \pi \cdot \left((5\text{m})^2 + (2\text{m})^2 \right)$$

21) Total Surface Area of Truncated Cone given Slant Height

Open Calculator

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

ex $$267.0354\text{m}^2 = \pi \cdot \left((5\text{m})^2 + (2\text{m})^2 + (8\text{m} \cdot (5\text{m} + 2\text{m})) \right)$$

22) Total Surface Area of Truncated Cone given Volume

Open Calculator

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

ex $$260.6247\text{m}^2 = \left(\pi \cdot (5\text{m} + 2\text{m}) \cdot \sqrt{\left(\frac{3 \cdot 290\text{m}^3}{\pi \cdot \left((5\text{m})^2 + (5\text{m} \cdot 2\text{m}) + (2\text{m})^2 \right)} \right)^2 + (5\text{m} - 2\text{m})^2} \right) + \left(\pi \cdot \left((5\text{m})^2 + \right. \right.$$

Surface to Volume Ratio of Truncated Cone

23) Surface to Volume Ratio of Truncated Cone

Open Calculator

fx $$R_{A/V} = 3 \cdot \frac{r_{Base}^2 + r_{Top}^2 + \left(\sqrt{(r_{Top} - r_{Base})^2 + h^2} \cdot (r_{Base} + r_{Top})\right)}{h \cdot \left(r_{Base}^2 + (r_{Base} \cdot r_{Top}) + r_{Top}^2\right)}$$

ex $$0.90451\text{m}^{-1} = 3 \cdot \frac{(5\text{m})^2 + (2\text{m})^2 + \left(\sqrt{(2\text{m} - 5\text{m})^2 + (7\text{m})^2} \cdot (5\text{m} + 2\text{m})\right)}{7\text{m} \cdot \left((5\text{m})^2 + (5\text{m} \cdot 2\text{m}) + (2\text{m})^2\right)}$$

24) Surface to Volume Ratio of Truncated Cone given Curved Surface Area

Open Calculator

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

ex $$0.897363\text{m}^{-1} = \frac{170\text{m}^2 + \pi \cdot \left((5\text{m})^2 + (2\text{m})^2\right)}{\frac{\pi \cdot \left((5\text{m})^2 + (5\text{m} \cdot 2\text{m}) + (2\text{m})^2\right)}{3} \cdot \sqrt{\left(\frac{170\text{m}^2}{\pi \cdot (5\text{m} + 2\text{m})}\right)^2 - (5\text{m} - 2\text{m})^2}}$$

25) Surface to Volume Ratio of Truncated Cone given Slant Height

Open Calculator

fx $$R_{A/V} = \frac{3 \cdot \left(r_{Base}^2 + r_{Top}^2 + (h_{Slant} \cdot (r_{Base} + r_{Top}))\right)}{\sqrt{h_{Slant}^2 - (r_{Base} - r_{Top})^2} \cdot \left(r_{Base}^2 + (r_{Base} \cdot r_{Top}) + r_{Top}^2\right)}$$

ex $$0.881646\text{m}^{-1} = \frac{3 \cdot \left((5\text{m})^2 + (2\text{m})^2 + (8\text{m} \cdot (5\text{m} + 2\text{m}))\right)}{\sqrt{(8\text{m})^2 - (5\text{m} - 2\text{m})^2} \cdot \left((5\text{m})^2 + (5\text{m} \cdot 2\text{m}) + (2\text{m})^2\right)}$$

Volume of Truncated Cone

26) Volume of Truncated Cone

Open Calculator

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

ex $$285.8849\text{m}^3 = \frac{\pi}{3} \cdot 7\text{m} \cdot \left((5\text{m})^2 + (5\text{m} \cdot 2\text{m}) + (2\text{m})^2\right)$$

27) Volume of Truncated Cone given Curved Surface Area

Open Calculator

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

ex $$290.9705\text{m}^3 = \frac{\pi}{3} \cdot \left((5\text{m})^2 + (5\text{m} \cdot 2\text{m}) + (2\text{m})^2\right) \cdot \sqrt{\left(\frac{170\text{m}^2}{\pi \cdot (5\text{m} + 2\text{m})}\right)^2 - (5\text{m} - 2\text{m})^2}$$

28) Volume of Truncated Cone given Slant Height

Open Calculator

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

ex $$302.8828\text{m}^3 = \frac{\pi}{3} \cdot \left((5\text{m})^2 + (5\text{m} \cdot 2\text{m}) + (2\text{m})^2\right) \cdot \sqrt{(8\text{m})^2 - (5\text{m} - 2\text{m})^2}$$

29) Volume of Truncated Cone given Total Surface Area

Open Calculator

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

ex $$288.7402\text{m}^3 = \frac{\pi}{3} \cdot \left((5\text{m})^2 + (5\text{m} \cdot 2\text{m}) + (2\text{m})^2\right) \cdot \sqrt{\left(\frac{260\text{m}^2 - \pi \cdot \left((5\text{m})^2 + (2\text{m})^2\right)}{\pi \cdot (5\text{m} + 2\text{m})}\right)^2 - (5\text{m} - 2\text{m})^2}$$

Variables Used

- A_{Base} Base Area of Truncated Cone *(Square Meter)*
- A_{Top} Top Area of Truncated Cone *(Square Meter)*
- **CSA** Curved Surface Area of Truncated Cone *(Square Meter)*
- **h** Height of Truncated Cone *(Meter)*
- h_{Slant} Slant Height of Truncated Cone *(Meter)*
- $R_{A/V}$ Surface to Volume Ratio of Truncated Cone *(1 per Meter)*
- r_{Base} Base Radius of Truncated Cone *(Meter)*
- r_{Top} Top Radius of Truncated Cone *(Meter)*
- **TSA** Total Surface Area of Truncated Cone *(Square Meter)*
- **V** Volume of Truncated Cone *(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
- Measurement: **Reciprocal Length** in 1 per Meter (m^{-1})
  Reciprocal Length Unit Conversion

Check other formula lists

- **Cone Formulas**
- **Truncated Cone Formulas**

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