

Important Square Cupola Formulas PDF



Formulas
Examples
with Units

List of 20
Important Square Cupola Formulas

1) Edge Length of Square Cupola Formulas

1.1) Edge Length of Square Cupola given Height Formula

Formula

$$l_e = \frac{h}{\sqrt{1 - \left(\frac{1}{4} \cdot \operatorname{cosec} \left(\frac{\pi}{4} \right)^2 \right)}}$$

Example with Units

$$9.8995\text{ m} = \frac{7\text{ m}}{\sqrt{1 - \left(\frac{1}{4} \cdot \operatorname{cosec} \left(\frac{3.1416}{4} \right)^2 \right)}}$$

Evaluate Formula 

1.2) Edge Length of Square Cupola given Surface to Volume Ratio Formula

Formula

$$l_e = \frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3} \right) \cdot R_{A/V}}$$

Example with Units

$$9.9173\text{ m} = \frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3} \right) \cdot 0.6\text{ m}^{-1}}$$

Evaluate Formula 

1.3) Edge Length of Square Cupola given Total Surface Area Formula

Formula

$$l_e = \sqrt{\frac{\text{TSA}}{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}}$$

Example with Units

$$10.0171\text{ m} = \sqrt{\frac{1160\text{ m}^2}{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}}$$

Evaluate Formula 

1.4) Edge Length of Square Cupola given Volume Formula

Formula

$$l_e = \left(\frac{V}{1 + \frac{2 \cdot \sqrt{2}}{3}} \right)^{\frac{1}{3}}$$

Example with Units

$$9.926\text{ m} = \left(\frac{1900\text{ m}^3}{1 + \frac{2 \cdot \sqrt{2}}{3}} \right)^{\frac{1}{3}}$$

Evaluate Formula 

2) Height of Square Cupola Formulas

2.1) Height of Square Cupola Formula

Formula

$$h = l_e \cdot \sqrt{1 - \left(\frac{1}{4} \cdot \operatorname{cosec} \left(\frac{\pi}{4} \right)^2 \right)}$$

Example with Units

$$7.0711\text{ m} = 10\text{ m} \cdot \sqrt{1 - \left(\frac{1}{4} \cdot \operatorname{cosec} \left(\frac{3.1416}{4} \right)^2 \right)}$$

Evaluate Formula 



2.2) Height of Square Cupola given Surface to Volume Ratio Formula

Formula

Evaluate Formula 

$$h = \frac{(7 + (2 \cdot \sqrt{2}) + \sqrt{3}) \cdot \sqrt{1 - \left(\frac{1}{4} \cdot \text{cosec}\left(\frac{\pi}{4}\right)^2\right)}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot R_{A/V}}$$

Example with Units

$$7.0126_m = \frac{(7 + (2 \cdot \sqrt{2}) + \sqrt{3}) \cdot \sqrt{1 - \left(\frac{1}{4} \cdot \text{cosec}\left(\frac{3.1416}{4}\right)^2\right)}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot 0.6_{m^{-1}}}$$

2.3) Height of Square Cupola given Total Surface Area Formula

Formula

Evaluate Formula 

$$h = \frac{\sqrt{\frac{TSA}{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}}}{\sqrt{1 - \left(\frac{1}{4} \cdot \text{cosec}\left(\frac{\pi}{4}\right)^2\right)}}$$

Example with Units

$$7.0831_m = \frac{\sqrt{\frac{1160_{m^2}}{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}}}{\sqrt{1 - \left(\frac{1}{4} \cdot \text{cosec}\left(\frac{3.1416}{4}\right)^2\right)}}$$

2.4) Height of Square Cupola given Volume Formula

Formula

Evaluate Formula 

$$h = \left(\frac{V}{1 + \frac{2 \cdot \sqrt{2}}{3}}\right)^{\frac{1}{3}} \cdot \sqrt{1 - \left(\frac{1}{4} \cdot \text{cosec}\left(\frac{\pi}{4}\right)^2\right)}$$

Example with Units

$$7.0187_m = \left(\frac{1900_{m^3}}{1 + \frac{2 \cdot \sqrt{2}}{3}}\right)^{\frac{1}{3}} \cdot \sqrt{1 - \left(\frac{1}{4} \cdot \text{cosec}\left(\frac{3.1416}{4}\right)^2\right)}$$

3) Surface Area of Square Cupola Formulas



3.1) Total Surface Area of Square Cupola Formulas

3.1.1) Total Surface Area of Square Cupola Formula

Formula

$$TSA = (7 + (2 \cdot \sqrt{2}) + \sqrt{3}) \cdot l_e^2$$

Example with Units

$$1156.0478\text{m}^2 = (7 + (2 \cdot \sqrt{2}) + \sqrt{3}) \cdot 10\text{m}^2$$

Evaluate Formula 

3.1.2) Total Surface Area of Square Cupola given Height Formula

Formula

$$TSA = (7 + (2 \cdot \sqrt{2}) + \sqrt{3}) \cdot \left(\frac{h^2}{1 - \left(\frac{1}{4} \cdot \text{cosec} \left(\frac{\pi}{4} \right)^2 \right)} \right)$$

Example with Units

$$1132.9268\text{m}^2 = (7 + (2 \cdot \sqrt{2}) + \sqrt{3}) \cdot \left(\frac{7\text{m}^2}{1 - \left(\frac{1}{4} \cdot \text{cosec} \left(\frac{3.1416}{4} \right)^2 \right)} \right)$$

Evaluate Formula 

3.1.3) Total Surface Area of Square Cupola given Surface to Volume Ratio Formula

Formula

$$TSA = (7 + (2 \cdot \sqrt{2}) + \sqrt{3}) \cdot \left(\frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3} \right) \cdot R_{A/V}} \right)^2$$

Example with Units

$$1137.0109\text{m}^2 = (7 + (2 \cdot \sqrt{2}) + \sqrt{3}) \cdot \left(\frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3} \right) \cdot 0.6\text{m}^{-1}} \right)^2$$

Evaluate Formula 

3.1.4) Total Surface Area of Square Cupola given Volume Formula

Formula

$$TSA = (7 + (2 \cdot \sqrt{2}) + \sqrt{3}) \cdot \left(\frac{V}{1 + \frac{2 \cdot \sqrt{2}}{3}} \right)^{\frac{2}{3}}$$

Example with Units

$$1139.0028\text{m}^2 = (7 + (2 \cdot \sqrt{2}) + \sqrt{3}) \cdot \left(\frac{1900\text{m}^3}{1 + \frac{2 \cdot \sqrt{2}}{3}} \right)^{\frac{2}{3}}$$

Evaluate Formula 



4) Surface to Volume Ratio of Square Cupola Formulas

4.1) Surface to Volume Ratio of Square Cupola Formula

Formula

$$R_{A/V} = \frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot l_e}$$

Example with Units

$$0.595 \text{ m}^{-1} = \frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot 10 \text{ m}}$$

Evaluate Formula 

4.2) Surface to Volume Ratio of Square Cupola given Height Formula

Formula

$$R_{A/V} = \frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot \left(\frac{h}{\sqrt{1 - \left(\frac{1}{4} \cdot \operatorname{cosec}\left(\frac{\pi}{4}\right)^2\right)}}\right)}$$

Example with Units

$$0.6011 \text{ m}^{-1} = \frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot \left(\frac{7 \text{ m}}{\sqrt{1 - \left(\frac{1}{4} \cdot \operatorname{cosec}\left(\frac{3.1416}{4}\right)^2\right)}}\right)}$$

Evaluate Formula 

4.3) Surface to Volume Ratio of Square Cupola given Total Surface Area Formula

Formula

$$R_{A/V} = \frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot \sqrt{\frac{TSA}{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}}}$$

Example with Units

$$0.594 \text{ m}^{-1} = \frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot \sqrt{\frac{1160 \text{ m}^2}{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}}}$$

Evaluate Formula 

4.4) Surface to Volume Ratio of Square Cupola given Volume Formula

Formula

$$R_{A/V} = \frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot \left(\frac{V}{1 + \frac{2 \cdot \sqrt{2}}{3}}\right)^{\frac{1}{3}}}$$

Example with Units

$$0.5995 \text{ m}^{-1} = \frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot \left(\frac{1900 \text{ m}^3}{1 + \frac{2 \cdot \sqrt{2}}{3}}\right)^{\frac{1}{3}}}$$

Evaluate Formula 

5) Volume of Square Cupola Formulas

5.1) Volume of Square Cupola Formula

Formula

$$V = \left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot l_e^3$$

Example with Units

$$1942.809 \text{ m}^3 = \left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot 10 \text{ m}^3$$

Evaluate Formula 



5.2) Volume of Square Cupola given Height Formula

Formula

Evaluate Formula 

$$V = \left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot \left(\frac{h}{\sqrt{1 - \left(\frac{1}{4} \cdot \operatorname{cosec}\left(\frac{\pi}{4}\right)^2\right)}}\right)^3$$

Example with Units

$$1884.8172 \text{ m}^3 = \left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot \left(\frac{7 \text{ m}}{\sqrt{1 - \left(\frac{1}{4} \cdot \operatorname{cosec}\left(\frac{3.1416}{4}\right)^2\right)}}\right)^3$$

5.3) Volume of Square Cupola given Surface to Volume Ratio Formula

Formula

Evaluate Formula 

$$V = \left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot \left(\frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot R_{A/V}}\right)^3$$

Example with Units

$$1895.0182 \text{ m}^3 = \left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot \left(\frac{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}{\left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot 0.6 \text{ m}^{-1}}\right)^3$$

5.4) Volume of Square Cupola given Total Surface Area Formula

Formula

Evaluate Formula 

$$V = \left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot \left(\frac{TSA}{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}\right)^{\frac{3}{2}}$$

Example with Units

$$1952.7804 \text{ m}^3 = \left(1 + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot \left(\frac{1160 \text{ m}^2}{7 + (2 \cdot \sqrt{2}) + \sqrt{3}}\right)^{\frac{3}{2}}$$



Variables used in list of Square Cupola Formulas above

- **h** Height of Square Cupola (Meter)
- **l_e** Edge Length of Square Cupola (Meter)
- **R_{A/V}** Surface to Volume Ratio of Square Cupola (1 per Meter)
- **TSA** Total Surface Area of Square Cupola (Square Meter)
- **V** Volume of Square Cupola (Cubic Meter)

Constants, Functions, Measurements used in list of Square Cupola Formulas above

- **constant(s):** **pi**,
3.14159265358979323846264338327950288
Archimedes' constant
- **Functions:** **cosec**, cosec(Angle)
The cosecant function is a trigonometric function that is the reciprocal of the sine function.
- **Functions:** **sec**, sec(Angle)
Secant is a trigonometric function that is defined ratio of the hypotenuse to the shorter side adjacent to an acute angle (in a right-angled triangle); the reciprocal of a cosine.
- **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 
- **Measurement:** **Reciprocal Length** in 1 per Meter (m⁻¹)
Reciprocal Length Unit Conversion 



Download other Important Cupola PDFs

- **Important Pentagonal Cupola Formulas** 
- **Important Square Cupola Formulas** 
- **Important Triangular Cupola Formulas** 

Try our Unique Visual Calculators

-  **Percentage change** 
-  **LCM of two numbers** 
-  **Proper fraction** 

Please SHARE this PDF with someone who needs it!

This PDF can be downloaded in these languages

[English](#) [Spanish](#) [French](#) [German](#) [Russian](#) [Italian](#) [Portuguese](#) [Polish](#) [Dutch](#)

7/8/2024 | 11:08:42 AM UTC

