

Important Truncated Cube Formulas PDF



Formulas Examples with Units

List of 18 Important Truncated Cube Formulas

1) Circumsphere Radius of Truncated Cube Formula

Formula

$$r_c = \frac{\sqrt{7 + (4 \cdot \sqrt{2})}}{2} \cdot l_e$$

Example with Units

$$17.7882\text{m} = \frac{\sqrt{7 + (4 \cdot \sqrt{2})}}{2} \cdot 10\text{m}$$

Evaluate Formula

2) Circumsphere Radius of Truncated Cube given Cubic Edge Length Formula

Formula

$$r_c = \frac{\sqrt{7 + (4 \cdot \sqrt{2})}}{2} \cdot \frac{l_{e(\text{Cube})}}{1 + \sqrt{2}}$$

Example with Units

$$17.6835\text{m} = \frac{\sqrt{7 + (4 \cdot \sqrt{2})}}{2} \cdot \frac{24\text{m}}{1 + \sqrt{2}}$$

Evaluate Formula

3) Midsphere Radius of Truncated Cube Formula

Formula

$$r_m = \frac{2 + \sqrt{2}}{2} \cdot l_e$$

Example with Units

$$17.0711\text{m} = \frac{2 + \sqrt{2}}{2} \cdot 10\text{m}$$

Evaluate Formula

4) Midsphere Radius of Truncated Cube given Cubic Edge Length Formula

Formula

$$r_m = \frac{2 + \sqrt{2}}{2} \cdot \frac{l_{e(\text{Cube})}}{1 + \sqrt{2}}$$

Example with Units

$$16.9706\text{m} = \frac{2 + \sqrt{2}}{2} \cdot \frac{24\text{m}}{1 + \sqrt{2}}$$

Evaluate Formula

5) Surface to Volume Ratio of Truncated Cube Formula

Formula

$$R_{A/V} = \frac{6 \cdot (6 + (6 \cdot \sqrt{2}) + \sqrt{3})}{l_e \cdot (21 + (14 \cdot \sqrt{2}))}$$

Example with Units

$$0.2385\text{m}^{-1} = \frac{6 \cdot (6 + (6 \cdot \sqrt{2}) + \sqrt{3})}{10\text{m} \cdot (21 + (14 \cdot \sqrt{2}))}$$

Evaluate Formula

6) Surface to Volume Ratio of Truncated Cube given Cubic Edge Length Formula

Formula

$$R_{A/V} = \frac{6 \cdot (6 + (6 \cdot \sqrt{2}) + \sqrt{3})}{\frac{l_{e(\text{Cube})}}{1 + \sqrt{2}} \cdot (21 + (14 \cdot \sqrt{2}))}$$

Example with Units

$$0.2399\text{m}^{-1} = \frac{6 \cdot (6 + (6 \cdot \sqrt{2}) + \sqrt{3})}{\frac{24\text{m}}{1 + \sqrt{2}} \cdot (21 + (14 \cdot \sqrt{2}))}$$

Evaluate Formula



7) Total Surface Area of Truncated Cube Formula

Formula

$$TSA = 2 \cdot (6 + (6 \cdot \sqrt{2}) + \sqrt{3}) \cdot l_e^2$$

Evaluate Formula 

Example with Units

$$3243.4664 \text{ m}^2 = 2 \cdot (6 + (6 \cdot \sqrt{2}) + \sqrt{3}) \cdot 10 \text{ m}^2$$

8) Total Surface Area of Truncated Cube given Cubic Edge Length Formula

Formula

$$TSA = 2 \cdot (6 + (6 \cdot \sqrt{2}) + \sqrt{3}) \cdot \left(\frac{l_{e(\text{Cube})}}{1 + \sqrt{2}} \right)^2$$

Evaluate Formula 

Example with Units

$$3205.3874 \text{ m}^2 = 2 \cdot (6 + (6 \cdot \sqrt{2}) + \sqrt{3}) \cdot \left(\frac{24 \text{ m}}{1 + \sqrt{2}} \right)^2$$

9) Volume of Truncated Cube Formula

Formula

$$V = \frac{21 + (14 \cdot \sqrt{2})}{3} \cdot l_e^3$$

Example with Units

$$13599.6633 \text{ m}^3 = \frac{21 + (14 \cdot \sqrt{2})}{3} \cdot 10 \text{ m}^3$$

Evaluate Formula 

10) Volume of Truncated Cube given Cubic Edge Length Formula

Formula

$$V = \frac{21 + (14 \cdot \sqrt{2})}{3} \cdot \left(\frac{l_{e(\text{Cube})}}{1 + \sqrt{2}} \right)^3$$

Example with Units

$$13360.8727 \text{ m}^3 = \frac{21 + (14 \cdot \sqrt{2})}{3} \cdot \left(\frac{24 \text{ m}}{1 + \sqrt{2}} \right)^3$$

Evaluate Formula 

11) Edge Length of Truncated Cube Formulas

11.1) Cubic Edge Length of Truncated Cube Formula

Formula

$$l_{e(\text{Cube})} = l_e \cdot (1 + \sqrt{2})$$

Example with Units

$$24.1421 \text{ m} = 10 \text{ m} \cdot (1 + \sqrt{2})$$

Evaluate Formula 

11.2) Cubic Edge Length of Truncated Cube given Midsphere Radius Formula

Formula

$$l_{e(\text{Cube})} = \frac{2 \cdot r_m}{2 + \sqrt{2}} \cdot (1 + \sqrt{2})$$

Example with Units

$$24.0416 \text{ m} = \frac{2 \cdot 17 \text{ m}}{2 + \sqrt{2}} \cdot (1 + \sqrt{2})$$

Evaluate Formula 



11.3) Cubic Edge Length of Truncated Cube given Total Surface Area Formula

Formula

Evaluate Formula 

$$l_e(\text{Cube}) = \sqrt{\frac{\text{TSA}}{2 \cdot (6 + (6 \cdot \sqrt{2}) + \sqrt{3})}} \cdot (1 + \sqrt{2})$$

Example with Units

$$23.9798\text{m} = \sqrt{\frac{3200\text{m}^2}{2 \cdot (6 + (6 \cdot \sqrt{2}) + \sqrt{3})}} \cdot (1 + \sqrt{2})$$

11.4) Cubic Edge Length of Truncated Cube given Volume Formula

Formula

Evaluate Formula 

$$l_e(\text{Cube}) = \left(\frac{3 \cdot V}{21 + (14 \cdot \sqrt{2})} \right)^{\frac{1}{3}} \cdot (1 + \sqrt{2})$$

Example with Units

$$24.3767\text{m} = \left(\frac{3 \cdot 14000\text{m}^3}{21 + (14 \cdot \sqrt{2})} \right)^{\frac{1}{3}} \cdot (1 + \sqrt{2})$$

11.5) Edge Length of Truncated Cube given Cubic Edge Length Formula

Formula

Example with Units

Evaluate Formula 

$$l_e = \frac{l_e(\text{Cube})}{1 + \sqrt{2}}$$

$$9.9411\text{m} = \frac{24\text{m}}{1 + \sqrt{2}}$$

11.6) Edge Length of Truncated Cube given Midsphere Radius Formula

Formula

Example with Units

Evaluate Formula 

$$l_e = \frac{2 \cdot r_m}{2 + \sqrt{2}}$$

$$9.9584\text{m} = \frac{2 \cdot 17\text{m}}{2 + \sqrt{2}}$$

11.7) Edge Length of Truncated Cube given Total Surface Area Formula

Formula

Example with Units

Evaluate Formula 

$$l_e = \sqrt{\frac{\text{TSA}}{2 \cdot (6 + (6 \cdot \sqrt{2}) + \sqrt{3})}}$$

$$9.9328\text{m} = \sqrt{\frac{3200\text{m}^2}{2 \cdot (6 + (6 \cdot \sqrt{2}) + \sqrt{3})}}$$

11.8) Edge Length of Truncated Cube given Volume Formula

Formula

Example with Units

Evaluate Formula 

$$l_e = \left(\frac{3 \cdot V}{21 + (14 \cdot \sqrt{2})} \right)^{\frac{1}{3}}$$





$$10.0972\text{m} = \left(\frac{3 \cdot 14000\text{m}^3}{21 + (14 \cdot \sqrt{2})} \right)^{\frac{1}{3}}$$



Variables used in list of Truncated Cube Formulas above












- l_e Edge Length of Truncated Cube (Meter)
- $l_e(\text{Cube})$ Cubic Edge Length of Truncated Cube (Meter)
- $R_{A/V}$ Surface to Volume Ratio of Truncated Cube (1 per Meter)
- r_c Circumsphere Radius of Truncated Cube (Meter)
- r_m Midsphere Radius of Truncated Cube (Meter)
- **TSA** Total Surface Area of Truncated Cube (Square Meter)
- **V** Volume of Truncated Cube (Cubic Meter)

Constants, Functions, Measurements used in list of Truncated Cube Formulas above

- **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 
- **Measurement:** **Reciprocal Length** in 1 per Meter (m^{-1})
Reciprocal Length Unit Conversion 



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