Important Formulas of Cuboid PDF

Formulas
Examples
with Units

List of 32
Important Formulas of Cuboid

1) Diagonal of Cuboid Formulas

1.1) Face Diagonals of Cuboid Formulas

1.1.1) Base Diagonal of Cuboid Formula

Evaluate Formula

Formula

$$d_{Base} = \sqrt{l^2 + w^2}$$

Example with Units

$$13.4164\,\text{m} = \sqrt{12\,\text{m}^2 + 6\,\text{m}^2}$$

1.1.2) Front Face Diagonal of Cuboid Formula

Evaluate Formula

Formula

$$d_{Front\ Face} = \sqrt{l^2 + h^2}$$

Example with Units

$$14.4222\,\text{m} = \sqrt{12\,\text{m}^2 + 8\,\text{m}^2}$$

1.1.3) Side Face Diagonal of Cuboid Formula

Evaluate Formula

Formula

$$d_{Side\ Face} = \sqrt{h^2 + w^2}$$

Example with Units

$$10\,\text{m} = \sqrt{8\,\text{m}^2 + 6\,\text{m}^2}$$

1.2) Space Diagonal of Cuboid Formulas

1.2.1) Space Diagonal of Cuboid Formula

Evaluate Formula

Formula

$$d_{Space} = \sqrt{l^2 + w^2 + h^2}$$

Example with Units

$$15.6205\,\text{m} = \sqrt{12\,\text{m}^2 + 6\,\text{m}^2 + 8\,\text{m}^2}$$

1.2.2) Space Diagonal of Cuboid given Lateral Surface Area, Length, and Height Formula

Evaluate Formula

Formula

$$d_{Space} = \sqrt{l^2 + \left(\frac{LSA}{2 \cdot h} - l\right)^2 + h^2}$$

Example with Units

$$15.9236\,\text{m} = \sqrt{12\,\text{m}^2 + \left(\frac{300\,\text{m}^2}{2 \cdot 8\,\text{m}} - 12\,\text{m}\right)^2 + 8\,\text{m}^2}$$

1.2.3) Space Diagonal of Cuboid given Total Surface Area, Length, and Width Formula

Evaluate Formula

Formula

$$d_{Space} = \sqrt{l^2 + w^2 + \left(\frac{\frac{TSA}{2} - (l \cdot w)}{l + w}\right)^2}$$

Example with Units

$$15.8824\,\text{m} = \sqrt{12\,\text{m}^2 + 6\,\text{m}^2 + \left(\frac{\frac{450\,\text{m}^2}{2} - (12\,\text{m} \cdot 6\,\text{m})}{12\,\text{m} + 6\,\text{m}}\right)^2}$$

1.2.4) Space Diagonal of Cuboid given Volume, Width, and Height Formula

Evaluate Formula

Formula

$$d_{Space} = \sqrt{\left(\frac{V}{w \cdot h}\right)^2 + w^2 + h^2}$$

Example with Units

$$16.0078\,\text{m} = \sqrt{\left(\frac{600\,\text{m}^3}{6\,\text{m} \cdot 8\,\text{m}}\right)^2 + 6\,\text{m}^2 + 8\,\text{m}^2}$$

2) Edges of Cuboid Formulas

2.1) Height of Cuboid given Lateral Surface Area Formula

Evaluate Formula

Formula

$$h = \frac{LSA}{2 \cdot (l + w)}$$

Example with Units

$$8.3333\,\text{m} = \frac{300\,\text{m}^2}{2 \cdot (12\,\text{m} + 6\,\text{m})}$$

2.2) Height of Cuboid given Volume Formula

Evaluate Formula

Formula

$$h = \frac{V}{l \cdot w}$$

Example with Units

$$8.3333\,\text{m} = \frac{600\,\text{m}^3}{12\,\text{m} \cdot 6\,\text{m}}$$

2.3) Length of Cuboid given Space Diagonal Formula

Evaluate Formula

Formula

$$l = \sqrt{d_{Space}^2 - w^2 - h^2}$$

Example with Units

$$12.49\,\text{m} = \sqrt{16\,\text{m}^2 - 6\,\text{m}^2 - 8\,\text{m}^2}$$

2.4) Length of Cuboid given Volume Formula

Evaluate Formula

Formula

$$l = \frac{V}{w \cdot h}$$

Example with Units

$$12.5\,\text{m} = \frac{600\,\text{m}^3}{6\,\text{m} \cdot 8\,\text{m}}$$

2.5) Width of Cuboid given Surface to Volume Ratio Formula

Evaluate Formula

Formula

$$w = \frac{l \cdot h}{\frac{R_{A/V} \cdot l \cdot h}{2} - (l + h)}$$

Example with Units

$$5.2174\,\text{m} = \frac{12\,\text{m} \cdot 8\,\text{m}}{\frac{0.8\,\text{m}^{-1} \cdot 12\,\text{m} \cdot 8\,\text{m}}{2} - (12\,\text{m} + 8\,\text{m})}$$

2.6) Width of Cuboid given Total Surface Area Formula

Evaluate Formula

Formula

$$w = \frac{\frac{TSA}{2} - (h \cdot l)}{h + l}$$

Example with Units

$$6.45\,\text{m} = \frac{\frac{450\,\text{m}^2}{2} - (8\,\text{m} \cdot 12\,\text{m})}{8\,\text{m} + 12\,\text{m}}$$

3) Perimeter of Cuboid Formulas

3.1) Perimeter of Cuboid Formula

Evaluate Formula

Formula

$$P = 4 \cdot (l + w + h)$$

Example with Units

$$104\,\text{m} = 4 \cdot (12\,\text{m} + 6\,\text{m} + 8\,\text{m})$$

3.2) Perimeter of Cuboid given Space Diagonal, Length, and Width Formula

Evaluate Formula

Formula

$$P = 4 \cdot \left(l + w + \sqrt{d_{Space}^2 - l^2 - w^2}\right)$$

Example with Units

$$106.8712\,\text{m} = 4 \cdot \left(12\,\text{m} + 6\,\text{m} + \sqrt{16\,\text{m}^2 - 12\,\text{m}^2 - 6\,\text{m}^2}\right)$$

3.3) Perimeter of Cuboid given Total Surface Area, Height, and Length Formula

Evaluate Formula

Formula

$$P = 4 \cdot \left(l + \frac{\frac{TSA}{2} - (h \cdot l)}{h + l} + h\right)$$

Example with Units

$$105.8\,\text{m} = 4 \cdot \left(12\,\text{m} + \frac{\frac{450\,\text{m}^2}{2} - (8\,\text{m} \cdot 12\,\text{m})}{8\,\text{m} + 12\,\text{m}} + 8\,\text{m}\right)$$

3.4) Perimeter of Cuboid given Volume, Height and Width Formula

Evaluate Formula

Formula

$$P = 4 \cdot \left(\frac{V}{w \cdot h} + h + w\right)$$

Example with Units

$$106\,\text{m} = 4 \cdot \left(\frac{600\,\text{m}^3}{6\,\text{m} \cdot 8\,\text{m}} + 8\,\text{m} + 6\,\text{m}\right)$$

4) Surface Area of Cuboid Formulas

4.1) Face Areas of Cuboid Formulas

4.1.1) Base Area of Cuboid Formula

Evaluate Formula

Formula

$$A_{Base} = l \cdot w$$

Example with Units

$$72\,\text{m}^2 = 12\,\text{m} \cdot 6\,\text{m}$$

4.1.2) Front Face Area of Cuboid Formula

Evaluate Formula

Formula

$$A_{Front\ Face} = l \cdot h$$

Example with Units

$$96\,\text{m}^2 = 12\,\text{m} \cdot 8\,\text{m}$$

4.1.3) Side Face Area of Cuboid Formula

Evaluate Formula

Formula

$$A_{Side\ Face} = h \cdot w$$

Example with Units

$$48\,\text{m}^2 = 8\,\text{m} \cdot 6\,\text{m}$$

4.2) Lateral Surface Area of Cuboid Formulas

4.2.1) Lateral Surface Area of Cuboid Formula

Evaluate Formula

Formula

$$LSA = 2 \cdot h \cdot (l + w)$$

Example with Units

$$288\,\text{m}^2 = 2 \cdot 8\,\text{m} \cdot (12\,\text{m} + 6\,\text{m})$$

4.2.2) Lateral Surface Area of Cuboid given Space Diagonal, Height and Width Formula

Evaluate Formula

Formula

$$LSA = 2 \cdot h \cdot \left(\sqrt{d_{Space}^{\,2} - w^2 - h^2} + w\right)$$

Example with Units

$$295.8399\,\text{m}^2 = 2 \cdot 8\,\text{m} \cdot \left(\sqrt{16\,\text{m}^{\,2} - 6\,\text{m}^{\,2} - 8\,\text{m}^{\,2}} + 6\,\text{m}\right)$$

4.2.3) Lateral Surface Area of Cuboid given Total Surface Area, Length and Width Formula

Evaluate Formula

Formula

$$LSA = TSA - (2 \cdot l \cdot w)$$

Example with Units

$$306\,\text{m}^2 = 450\,\text{m}^2 - (2 \cdot 12\,\text{m} \cdot 6\,\text{m})$$

4.2.4) Lateral Surface Area of Cuboid given Volume, Length and Height Formula

Evaluate Formula

Formula

$$LSA = 2 \cdot h \cdot \left(l + \frac{V}{l \cdot h}\right)$$

Example with Units

$$292\,\text{m}^2 = 2 \cdot 8\,\text{m} \cdot \left(12\,\text{m} + \frac{600\,\text{m}^3}{12\,\text{m} \cdot 8\,\text{m}}\right)$$

4.3) Total Surface Area of Cuboid Formulas

4.3.1) Total Surface Area of Cuboid Formula

Evaluate Formula

Formula

$$TSA = 2 \cdot ((l \cdot h) + (h \cdot w) + (l \cdot w))$$

Example with Units

$$432\,\text{m}^2 = 2 \cdot ((12\,\text{m} \cdot 8\,\text{m}) + (8\,\text{m} \cdot 6\,\text{m}) + (12\,\text{m} \cdot 6\,\text{m}))$$

4.3.2) Total Surface Area of Cuboid given Lateral Surface Area, Height and Width Formula

Evaluate Formula

Formula

$$TSA = 2 \cdot \left(\left(\left(\frac{LSA}{2 \cdot h} - w\right) \cdot h\right) + (h \cdot w) + \left(\left(\frac{LSA}{2 \cdot h} - w\right) \cdot w\right)\right)$$

Example with Units

$$453\,\text{m}^2 = 2 \cdot \left(\left(\left(\frac{300\,\text{m}^2}{2 \cdot 8\,\text{m}} - 6\,\text{m}\right) \cdot 8\,\text{m}\right) + (8\,\text{m} \cdot 6\,\text{m}) + \left(\left(\frac{300\,\text{m}^2}{2 \cdot 8\,\text{m}} - 6\,\text{m}\right) \cdot 6\,\text{m}\right)\right)$$

4.3.3) Total Surface Area of Cuboid given Space Diagonal, Length and Height Formula

Evaluate Formula

Formula

$$TSA = 2 \cdot \left((l \cdot h) + \left(h \cdot \sqrt{d_{Space}^2 - l^2 - h^2}\right) + \left(l \cdot \sqrt{d_{Space}^2 - l^2 - h^2}\right)\right)$$

Example with Units

$$469.1281\,\text{m}^2 = 2 \cdot \left((12\,\text{m} \cdot 8\,\text{m}) + \left(8\,\text{m} \cdot \sqrt{16\,\text{m}^2 - 12\,\text{m}^2 - 8\,\text{m}^2}\right) + \left(12\,\text{m} \cdot \sqrt{16\,\text{m}^2 - 12\,\text{m}^2 - 8\,\text{m}^2}\right)\right)$$

4.3.4) Total Surface Area of Cuboid given Volume, Length and Width Formula

Evaluate Formula

Formula

$$TSA = 2 \cdot \left(\frac{V}{l} + (l \cdot w) + \frac{V}{w}\right)$$

Example with Units

$$444\,\text{m}^2 = 2 \cdot \left(\frac{600\,\text{m}^3}{12\,\text{m}} + (12\,\text{m} \cdot 6\,\text{m}) + \frac{600\,\text{m}^3}{6\,\text{m}}\right)$$

5) Volume of Cuboid Formulas

5.1) Volume of Cuboid Formula

Evaluate Formula

Formula

$$V = l \cdot w \cdot h$$

Example with Units

$$576\,\text{m}^3 = 12\,\text{m} \cdot 6\,\text{m} \cdot 8\,\text{m}$$

5.2) Volume of Cuboid given Lateral Surface Area, Width and Height Formula

Evaluate Formula

Formula

$$V = \left(\frac{LSA}{2 \cdot h} - w\right) \cdot w \cdot h$$

Example with Units

$$612\,\text{m}^3 = \left(\frac{300\,\text{m}^2}{2 \cdot 8\,\text{m}} - 6\,\text{m}\right) \cdot 6\,\text{m} \cdot 8\,\text{m}$$

5.3) Volume of Cuboid given Space Diagonal, Length and Width Formula

Evaluate Formula

Formula

$$V = l \cdot w \cdot \sqrt{d_{Space}^2 - l^2 - w^2}$$

Example with Units

$$627.6814\,\text{m}^3 = 12\,\text{m} \cdot 6\,\text{m} \cdot \sqrt{16\,\text{m}^2 - 12\,\text{m}^2 - 6\,\text{m}^2}$$

5.4) Volume of Cuboid given Total Surface Area, Width and Height Formula

Evaluate Formula

Formula

$$V = \frac{\frac{TSA}{2} - (h \cdot w)}{h + w} \cdot w \cdot h$$

Example with Units

$$606.8571\,\text{m}^3 = \frac{\frac{450\,\text{m}^2}{2} - (8\,\text{m} \cdot 6\,\text{m})}{8\,\text{m} + 6\,\text{m}} \cdot 6\,\text{m} \cdot 8\,\text{m}$$

Variables used in list of Important Formulas of Cuboid above

- A_{Base} Base Area of Cuboid *(Square Meter)*
- $A_{Front\ Face}$ Front Face Area of Cuboid *(Square Meter)*
- $A_{Side\ Face}$ Side Face Area of Cuboid *(Square Meter)*
- d_{Base} Base Diagonal of Cuboid *(Meter)*
- $d_{Front\ Face}$ Front Face Diagonal of Cuboid *(Meter)*
- $d_{Side\ Face}$ Side Face Diagonal of Cuboid *(Meter)*
- d_{Space} Space Diagonal of Cuboid *(Meter)*
- **h** Height of Cuboid *(Meter)*
- **l** Length of Cuboid *(Meter)*
- **LSA** Lateral Surface Area of Cuboid *(Square Meter)*
- **P** Perimeter of Cuboid *(Meter)*
- $R_{A/V}$ Surface to Volume Ratio of Cuboid *(1 per Meter)*
- **TSA** Total Surface Area of Cuboid *(Square Meter)*
- **V** Volume of Cuboid *(Cubic Meter)*
- **w** Width of Cuboid *(Meter)*

Constants, Functions, Measurements used in list of Important Formulas of Cuboid 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

Download other Important Cuboid PDFs

- Important Cuboid Formulas
- Important Cut Cuboid Formulas
- Important Half Cuboid Formulas
- Important Skewed Cuboid Formulas
- Important Wedge Cuboid Formulas

Try our Unique Visual Calculators

- Reverse percentage
- HCF calculator
- Simple 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

7/9/2024 | 1:28:43 PM UTC