## Important Formulas of Cuboid

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## List of 32 Important Formulas of Cuboid

## Important Formulas of Cuboid $E^{〔}$

## Diagonal of Cuboid

## Face Diagonals of Cuboid

1) Base Diagonal of Cuboid
$f \times{ }^{d_{\text {Base }}=\sqrt{\mathrm{l}^{2}+\mathrm{w}^{2}}}$
ex $13.41641 \mathrm{~m}=\sqrt{(12 \mathrm{~m})^{2}+(6 \mathrm{~m})^{2}}$
2) Front Face Diagonal of Cuboid
fx $\mathrm{d}_{\text {Front Face }}=\sqrt{1^{2}+\mathrm{h}^{2}}$
ex $14.42221 \mathrm{~m}=\sqrt{(12 \mathrm{~m})^{2}+(8 \mathrm{~m})^{2}}$
3) Side Face Diagonal of Cuboid
$f \mathrm{~d} \mathrm{~d}_{\text {Side Face }}=\sqrt{\mathrm{h}^{2}+\mathrm{w}^{2}}$
ex $10 \mathrm{~m}=\sqrt{(8 \mathrm{~m})^{2}+(6 \mathrm{~m})^{2}}$

## Space Diagonal of Cuboid

4) Space Diagonal of Cuboid
$\mathrm{fx} \mathrm{d}_{\text {Space }}=\sqrt{\mathrm{l}^{2}+\mathrm{w}^{2}+\mathrm{h}^{2}}$
ex $15.6205 \mathrm{~m}=\sqrt{(12 \mathrm{~m})^{2}+(6 \mathrm{~m})^{2}+(8 \mathrm{~m})^{2}}$
5) Space Diagonal of Cuboid given Lateral Surface Area, Length, and Height
$f \mathbf{x} \mathrm{~d}_{\text {Space }}=\sqrt{\mathrm{l}^{2}+\left(\frac{\mathrm{LSA}}{2 \cdot \mathrm{~h}}-\mathrm{l}\right)^{2}+\mathrm{h}^{2}}$
ex $15.92365 \mathrm{~m}=\sqrt{(12 \mathrm{~m})^{2}+\left(\frac{300 \mathrm{~m}^{2}}{2 \cdot 8 \mathrm{~m}}-12 \mathrm{~m}\right)^{2}+(8 \mathrm{~m})^{2}}$
6) Space Diagonal of Cuboid given Total Surface Area, Length, and Width
$f \times \mathrm{d}_{\text {Space }}=\sqrt{\mathrm{l}^{2}+\mathrm{w}^{2}+\left(\frac{\frac{\mathrm{TSA}}{2}-(\mathrm{l} \cdot \mathrm{w})}{\mathrm{l}+\mathrm{w}}\right)^{2}}$
ex $15.88238 \mathrm{~m}=\sqrt{(12 \mathrm{~m})^{2}+(6 \mathrm{~m})^{2}+\left(\frac{\frac{450 \mathrm{~m}^{2}}{2}-(12 \mathrm{~m} \cdot 6 \mathrm{~m})}{12 \mathrm{~m}+6 \mathrm{~m}}\right)^{2}}$
7) Space Diagonal of Cuboid given Volume, Width, and Height
$\mathrm{fx} \mathrm{d}_{\text {Space }}=\sqrt{\left(\frac{\mathrm{V}}{\mathrm{w} \cdot \mathrm{h}}\right)^{2}+\mathrm{w}^{2}+\mathrm{h}^{2}}$
ex $16.00781 \mathrm{~m}=\sqrt{\left(\frac{600 \mathrm{~m}^{3}}{6 \mathrm{~m} \cdot 8 \mathrm{~m}}\right)^{2}+(6 \mathrm{~m})^{2}+(8 \mathrm{~m})^{2}}$

## Edges of Cuboid

8) Height of Cuboid given Lateral Surface Area
$\mathrm{fx} \mathrm{h}=\frac{\text { LSA }}{2 \cdot(1+\mathrm{w})}$
ex
$8.333333 \mathrm{~m}=\frac{300 \mathrm{~m}^{2}}{2 \cdot(12 \mathrm{~m}+6 \mathrm{~m})}$
9) Height of Cuboid given Volume 〔
$f \mathrm{f}=\frac{\mathrm{V}}{\mathrm{l} \cdot \mathrm{w}}$
ex $8.333333 \mathrm{~m}=\frac{600 \mathrm{~m}^{3}}{12 \mathrm{~m} \cdot 6 \mathrm{~m}}$
10) Length of Cuboid given Space Diagonal
$\mathrm{fx} l=\sqrt{\mathrm{d}_{\text {Space }}^{2}-\mathrm{w}^{2}-\mathrm{h}^{2}}$
ex $12.49 \mathrm{~m}=\sqrt{(16 \mathrm{~m})^{2}-(6 \mathrm{~m})^{2}-(8 \mathrm{~m})^{2}}$
11) Length of Cuboid given Volume
$f \mathrm{fx}=\frac{\mathrm{V}}{\mathrm{w} \cdot \mathrm{h}}$
ex $12.5 \mathrm{~m}=\frac{600 \mathrm{~m}^{3}}{6 \mathrm{~m} \cdot 8 \mathrm{~m}}$
12) Width of Cuboid given Surface to Volume Ratio
$\mathrm{fx} \mathrm{w}=\frac{\mathrm{l} \cdot \mathrm{h}}{\frac{\mathrm{R}_{\mathrm{A} / \mathrm{V} \cdot} \cdot \mathrm{h}}{2}-(\mathrm{l}+\mathrm{h})}$
ex $5.217391 \mathrm{~m}=\frac{12 \mathrm{~m} \cdot 8 \mathrm{~m}}{\frac{0.8 \mathrm{~m}^{-} \cdot 12 \mathrm{~m} \cdot 8 \mathrm{~m}}{2}-(12 \mathrm{~m}+8 \mathrm{~m})}$
13) Width of Cuboid given Total Surface Area
$\mathbf{f x} w=\frac{\frac{\text { TSA }}{2}-(h \cdot l)}{h+l}$
$x .45 \mathrm{~m}=\frac{\frac{450 \mathrm{~m}^{2}}{2}-(8 \mathrm{~m} \cdot 12 \mathrm{~m})}{8 \mathrm{~m}+12 \mathrm{~m}}$

## Perimeter of Cuboid

14) Perimeter of Cuboid
$\mathrm{fx} P=4 \cdot(\mathrm{l}+\mathrm{w}+\mathrm{h})$
ex $104 \mathrm{~m}=4 \cdot(12 \mathrm{~m}+6 \mathrm{~m}+8 \mathrm{~m})$
15) Perimeter of Cuboid given Space Diagonal, Length, and Width
$\mathrm{P}=4 \cdot\left(\mathrm{l}+\mathrm{w}+\sqrt{\mathrm{d}_{\text {Space }}^{2}-\mathrm{l}^{2}-\mathrm{w}^{2}}\right)$
ex $106.8712 \mathrm{~m}=4 \cdot\left(12 \mathrm{~m}+6 \mathrm{~m}+\sqrt{(16 \mathrm{~m})^{2}-(12 \mathrm{~m})^{2}-(6 \mathrm{~m})^{2}}\right)$
16) Perimeter of Cuboid given Total Surface Area, Height, and Length
$f \mathbf{f x}=4 \cdot\left(1+\frac{\frac{\text { TSA }}{2}-(h \cdot l)}{h+l}+h\right)$
$\operatorname{ex} 105.8 \mathrm{~m}=4 \cdot\left(12 \mathrm{~m}+\frac{\frac{450 \mathrm{~m}^{2}}{2}-(8 \mathrm{~m} \cdot 12 \mathrm{~m})}{8 \mathrm{~m}+12 \mathrm{~m}}+8 \mathrm{~m}\right)$
17) Perimeter of Cuboid given Volume, Height and Width
$\mathrm{fx} \mathrm{P}=4 \cdot\left(\frac{\mathrm{~V}}{\mathrm{w} \cdot \mathrm{h}}+\mathrm{h}+\mathrm{w}\right)$
ex $106 \mathrm{~m}=4 \cdot\left(\frac{600 \mathrm{~m}^{3}}{6 \mathrm{~m} \cdot 8 \mathrm{~m}}+8 \mathrm{~m}+6 \mathrm{~m}\right)$

## Surface Area of Cuboid 솟

## Face Areas of Cuboid

18) Base Area of Cuboid
fx $A_{\text {Base }}=1 \cdot w$
ex $72 \mathrm{~m}^{2}=12 \mathrm{~m} \cdot 6 \mathrm{~m}$
19) Front Face Area of Cuboid
$f x \mathrm{~A}_{\text {Front Face }}=\mathrm{l} \cdot \mathrm{h}$
ex $96 \mathrm{~m}^{2}=12 \mathrm{~m} \cdot 8 \mathrm{~m}$
20) Side Face Area of Cuboid
$f x \mathrm{~A}_{\text {Side Face }}=\mathrm{h} \cdot \mathrm{w}$
ex $48 \mathrm{~m}^{2}=8 \mathrm{~m} \cdot 6 \mathrm{~m}$
Lateral Surface Area of Cuboid
21) Lateral Surface Area of Cuboid $\begin{aligned} & \text { ■ }\end{aligned}$
$\mathrm{fx} \mathrm{LSA}=2 \cdot \mathrm{~h} \cdot(\mathrm{l}+\mathrm{w})$
ex $288 \mathrm{~m}^{2}=2 \cdot 8 \mathrm{~m} \cdot(12 \mathrm{~m}+6 \mathrm{~m})$
22) Lateral Surface Area of Cuboid given Space Diagonal, Height and Width
$f \times \mathrm{LSA}=2 \cdot \mathrm{~h} \cdot\left(\sqrt{\mathrm{~d}_{\text {Space }}^{2}-\mathrm{w}^{2}-\mathrm{h}^{2}}+\mathrm{w}\right)$
Open Calculator ©
ex $295.8399 m^{2}=2 \cdot 8 \mathrm{~m} \cdot\left(\sqrt{(16 \mathrm{~m})^{2}-(6 \mathrm{~m})^{2}-(8 \mathrm{~m})^{2}}+6 \mathrm{~m}\right)$
23) Lateral Surface Area of Cuboid given Total Surface Area, Length and Width
$\mathrm{fx} \mathrm{LSA}=\mathrm{TSA}-(2 \cdot \mathrm{l} \cdot \mathrm{w})$
ex $306 \mathrm{~m}^{2}=450 \mathrm{~m}^{2}-(2 \cdot 12 \mathrm{~m} \cdot 6 \mathrm{~m})$
24) Lateral Surface Area of Cuboid given Volume, Length and Height $\boxed{\square}$
f* $\mathrm{LSA}=2 \cdot \mathrm{~h} \cdot\left(1+\frac{\mathrm{V}}{\mathrm{l} \cdot \mathrm{h}}\right)$
Open Calculator
ex $292 \mathrm{~m}^{2}=2 \cdot 8 \mathrm{~m} \cdot\left(12 \mathrm{~m}+\frac{600 \mathrm{~m}^{3}}{12 \mathrm{~m} \cdot 8 \mathrm{~m}}\right)$

## Total Surface Area of Cuboid

25) Total Surface Area of Cuboid
f. $\mathrm{TSA}=2 \cdot((\mathrm{l} \cdot \mathrm{h})+(\mathrm{h} \cdot \mathrm{w})+(\mathrm{l} \cdot \mathrm{w}))$
ex $432 \mathrm{~m}^{2}=2 \cdot((12 \mathrm{~m} \cdot 8 \mathrm{~m})+(8 \mathrm{~m} \cdot 6 \mathrm{~m})+(12 \mathrm{~m} \cdot 6 \mathrm{~m}))$
26) Total Surface Area of Cuboid given Lateral Surface Area, Height and Width
$f \mathrm{fx} \mathrm{TSA}=2 \cdot\left(\left(\left(\frac{\mathrm{LSA}}{2 \cdot \mathrm{~h}}-\mathrm{w}\right) \cdot \mathrm{h}\right)+(\mathrm{h} \cdot \mathrm{w})+\left(\left(\frac{\mathrm{LSA}}{2 \cdot \mathrm{~h}}-\mathrm{w}\right) \cdot \mathrm{w}\right)\right)$
ex $453 \mathrm{~m}^{2}=2 \cdot\left(\left(\left(\frac{300 \mathrm{~m}^{2}}{2 \cdot 8 \mathrm{~m}}-6 \mathrm{~m}\right) \cdot 8 \mathrm{~m}\right)+(8 \mathrm{~m} \cdot 6 \mathrm{~m})+\left(\left(\frac{300 \mathrm{~m}^{2}}{2 \cdot 8 \mathrm{~m}}-6 \mathrm{~m}\right) \cdot 6 \mathrm{~m}\right)\right)$
27) Total Surface Area of Cuboid given Space Diagonal, Length and Height
fx $\operatorname{TSA}=2 \cdot\left((l \cdot h)+\left(h \cdot \sqrt{d_{\text {Space }}^{2}-l^{2}-h^{2}}\right)+\left(l \cdot \sqrt{d_{\text {Space }}^{2}-l^{2}-h^{2}}\right)\right)$
$469.1281 \mathrm{~m}^{2}=2 \cdot\left((12 \mathrm{~m} \cdot 8 \mathrm{~m})+\left(8 \mathrm{~m} \cdot \sqrt{(16 \mathrm{~m})^{2}-(12 \mathrm{~m})^{2}-(8 \mathrm{~m})^{2}}\right)+\left(12 \mathrm{~m} \cdot \sqrt{(16 \mathrm{~m})^{2}-(12 \mathrm{~m})^{2}-(8 \mathrm{~m})}\right.\right.$
28) Total Surface Area of Cuboid given Volume, Length and Width
$\mathrm{fx} \mathrm{TSA}=2 \cdot\left(\frac{\mathrm{~V}}{\mathrm{l}}+(\mathrm{l} \cdot \mathrm{w})+\frac{\mathrm{V}}{\mathrm{w}}\right)$
ex $444 \mathrm{~m}^{2}=2 \cdot\left(\frac{600 \mathrm{~m}^{3}}{12 \mathrm{~m}}+(12 \mathrm{~m} \cdot 6 \mathrm{~m})+\frac{600 \mathrm{~m}^{3}}{6 \mathrm{~m}}\right)$

## Volume of Cuboid

29) Volume of Cuboid
$f \mathrm{f} \mathrm{V}=\mathrm{l} \cdot \mathrm{w} \cdot \mathrm{h}$
ex $576 \mathrm{~m}^{3}=12 \mathrm{~m} \cdot 6 \mathrm{~m} \cdot 8 \mathrm{~m}$
30) Volume of Cuboid given Lateral Surface Area, Width and Height
$\mathrm{fx} \mathrm{V}=\left(\frac{\mathrm{LSA}}{2 \cdot \mathrm{~h}}-\mathrm{w}\right) \cdot \mathrm{w} \cdot \mathrm{h}$
ex $612 \mathrm{~m}^{3}=\left(\frac{300 \mathrm{~m}^{2}}{2 \cdot 8 \mathrm{~m}}-6 \mathrm{~m}\right) \cdot 6 \mathrm{~m} \cdot 8 \mathrm{~m}$
31) Volume of Cuboid given Space Diagonal, Length and Width
$f \mathbf{x} \mathrm{~V}=\mathrm{l} \cdot \mathrm{w} \cdot \sqrt{\mathrm{d}_{\text {Space }}^{2}-\mathrm{l}^{2}-\mathrm{w}^{2}}$
ex $627.6814 \mathrm{~m}^{3}=12 \mathrm{~m} \cdot 6 \mathrm{~m} \cdot \sqrt{(16 \mathrm{~m})^{2}-(12 \mathrm{~m})^{2}-(6 \mathrm{~m})^{2}}$
32) Volume of Cuboid given Total Surface Area, Width and Height
$f \mathrm{fx}=\frac{\frac{\mathrm{TSA}}{2}-(\mathrm{h} \cdot \mathrm{w})}{\mathrm{h}+\mathrm{w}} \cdot \mathrm{w} \cdot \mathrm{h}$
ex $606.8571 \mathrm{~m}^{3}=\frac{\frac{450 \mathrm{~m}^{2}}{2}-(8 \mathrm{~m} \cdot 6 \mathrm{~m})}{8 \mathrm{~m}+6 \mathrm{~m}} \cdot 6 \mathrm{~m} \cdot 8 \mathrm{~m}$

## Variables Used

- ABase Base Area of Cuboid (Square Meter)
- AFront Face Front Face Area of Cuboid (Square Meter)
- Aside Face Side Face Area of Cuboid (Square Meter)
- dBase Base Diagonal of Cuboid (Meter)
- dFront Face Front Face Diagonal of Cuboid (Meter)
- $\mathbf{d}_{\text {Side Face }}$ Side Face Diagonal of Cuboid (Meter)
- $\mathbf{d}_{\text {Space }}$ Space Diagonal of Cuboid (Meter)
- h Height of Cuboid (Meter)
- I Length of Cuboid (Meter)
- LSA Lateral Surface Area of Cuboid (Square Meter)
- P Perimeter of Cuboid (Meter)
- $\mathbf{R}_{\mathbf{A} / \mathbf{V}}$ 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

- Function: sqrt, sqrt(Number)

Square root function

- Measurement: Length in Meter (m)

Length Unit Conversion

- Measurement: Volume in Cubic Meter ( $\mathrm{m}^{3}$ )

Volume Unit Conversion

- Measurement: Area in Square Meter ( $\mathrm{m}^{2}$ )

Area Unit Conversion

- Measurement: Reciprocal Length in 1 per Meter $\left(\mathrm{m}^{-1}\right)$

Reciprocal Length Unit Conversion

## Check other formula lists

- Cuboid Formulas $\Xi$
- Cut Cuboid Formulas
- Half Cuboid Formulas
- Skewed Cuboid Formulas
- Truncated Cuboid Formulas
- Wedge Cuboid Formulas

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