



Important Formulas of Tetrahedron

Calculators!

Examples!

Conversions!

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List of 24 Important Formulas of Tetrahedron

Important Formulas of Tetrahedron 🗗

Edge Length of Tetrahedron

1) Edge Length of Tetrahedron given Circumsphere Radius 🗗



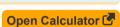
$$m l_e = 2 \cdot \sqrt{rac{2}{3} \cdot r_c}$$

$$9.797959 ext{m} = 2 \cdot \sqrt{rac{2}{3} \cdot 6 ext{m}}$$

2) Edge Length of Tetrahedron given Face Area

$$ho_{
m e}
ho_{
m e} = \sqrt{rac{4 \cdot {
m A}_{
m Face}}{\sqrt{3}}}$$

ex
$$10.19427 \mathrm{m} = \sqrt{rac{4 \cdot 45 \mathrm{m}^2}{\sqrt{3}}}$$



Open Calculator





Open Calculator 2

$$m l_e = \sqrt{rac{TSA}{\sqrt{3}}}$$

$$9.907045 \mathrm{m} = \sqrt{\frac{170 \mathrm{m}^2}{\sqrt{3}}}$$

4) Edge Length of Tetrahedron given Volume

 $\left|\mathbf{l}_{\mathrm{e}}
ight|=\left(6\cdot\sqrt{2}\cdot\mathrm{V}
ight)^{rac{1}{3}}$

Open Calculator

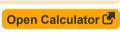
$$\boxed{\textbf{ex}} \boxed{10.06041 \text{m} = \left(6 \cdot \sqrt{2} \cdot 120 \text{m}^3\right)^{\frac{1}{3}}}$$

Height of Tetrahedron

5) Height of Tetrahedron 💪

$$\mathbf{f}$$
 $\mathbf{h} = \sqrt{rac{2}{3}} \cdot \mathbf{l}_{\mathrm{e}}$

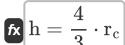
$$8.164966 \mathrm{m} = \sqrt{rac{2}{3}} \cdot 10 \mathrm{m}$$







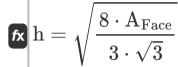
6) Height of Tetrahedron given Circumsphere Radius



Open Calculator

$$8m = \frac{4}{3} \cdot 6m$$

7) Height of Tetrahedron given Face Area



Open Calculator 🖒

ex
$$8.323583 \mathrm{m} = \sqrt{rac{8 \cdot 45 \mathrm{m}^2}{3 \cdot \sqrt{3}}}$$

8) Height of Tetrahedron given Volume 🗗

$$\mathbf{h} = \sqrt{rac{2}{3}} \cdot \left(6 \cdot \sqrt{2} \cdot \mathrm{V}
ight)^{rac{1}{3}}$$

$$oxed{ex} 8.214293 \mathrm{m} = \sqrt{rac{2}{3}} \cdot \left(6 \cdot \sqrt{2} \cdot 120 \mathrm{m}^3
ight)^{rac{1}{3}}$$



Radius of Tetrahedron

9) Circumsphere Radius of Tetrahedron

$$\mathbf{r}_{\mathrm{c}} = rac{1}{2} \cdot \sqrt{rac{3}{2}} \cdot \mathrm{l}_{\mathrm{e}}$$

Open Calculator 🚰

$$\mathbf{ex} = 6.123724 \mathrm{m} = rac{1}{2} \cdot \sqrt{rac{3}{2}} \cdot 10 \mathrm{m}$$

10) Circumsphere Radius of Tetrahedron given Height

$$\mathbf{f}\mathbf{x} egin{pmatrix} \mathbf{r}_{\mathrm{c}} = rac{3}{4} \cdot \mathbf{h} \end{pmatrix}$$

Open Calculator 🖒

$$\boxed{6m = \frac{3}{4} \cdot 8m}$$

11) Insphere Radius of Tetrahedron 🚰

$$\mathbf{f}_{\mathbf{r}} = rac{\mathrm{l_e}}{2 \cdot \sqrt{6}}$$

Open Calculator 🖸

$$=$$
 $2.041241 \mathrm{m} = rac{10 \mathrm{m}}{2 \cdot \sqrt{6}}$



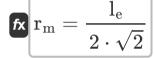
12) Insphere Radius of Tetrahedron given Face Area

Open Calculator

$$\mathbf{r}_{\mathrm{i}} = rac{\sqrt{rac{4\cdot\mathrm{A}_{\mathrm{Face}}}{\sqrt{3}}}}{2\cdot\sqrt{6}}$$

$$extbf{ex} \ 2.080896 ext{m} = rac{\sqrt{rac{4 \cdot 45 ext{m}^2}{\sqrt{3}}}}{2 \cdot \sqrt{6}}$$

13) Midsphere Radius of Tetrahedron



Open Calculator 2

ex
$$3.535534 \mathrm{m} = rac{10 \mathrm{m}}{2 \cdot \sqrt{2}}$$

14) Midsphere Radius of Tetrahedron given Insphere Radius 🗗



Open Calculator G

$$\boxed{\textbf{ex} \ 3.464102 \text{m} = \sqrt{3} \cdot 2 \text{m}}$$

Surface Area of Tetrahedron 🗗

$$A_{
m Face} = rac{\sqrt{3}}{4} \cdot l_{
m e}^2$$

15) Face Area of Tetrahedron

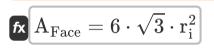
Open Calculator

$$\sqrt{3}$$

$$=$$
 $43.30127 \mathrm{m}^2 = rac{\sqrt{3}}{4} \cdot (10 \mathrm{m})^2$

16) Face Area of Tetrahedron given Insphere Radius 🗗

 $41.56922 \mathrm{m}^2 = 6 \cdot \sqrt{3} \cdot (2 \mathrm{m})^2$



Open Calculator

fx $ext{TSA} = \sqrt{3} \cdot ext{l}_{ ext{e}}^2$

Open Calculator G

$ext{ex} \ 173.2051 ext{m}^2 = \sqrt{3} \cdot \left(10 ext{m}\right)^2$



$$ag{TSA} = \sqrt{3} \cdot \left(rac{2 \cdot \sqrt{2} \cdot ext{r}_{ ext{c}}}{\sqrt{3}}
ight)^2$$

Open Calculator

$$extbf{ex} 166.2769 ext{m}^2 = \sqrt{3} \cdot \left(rac{2 \cdot \sqrt{2} \cdot 6 ext{m}}{\sqrt{3}}
ight)^2$$





19) Total Surface Area of Tetrahedron given Height

 $ag{TSA} = \sqrt{3} \cdot \left(\sqrt{rac{3}{2}} \cdot ext{h}
ight)^2$

Open Calculator

ex $166.2769 \mathrm{m}^2 = \sqrt{3} \cdot \left(\sqrt{rac{3}{2}} \cdot 8 \mathrm{m}
ight)^2$

20) Total Surface Area of Tetrahedron given Volume

 $ag{TSA} = \sqrt{3} \cdot \left(rac{12 \cdot ext{V}}{\sqrt{2}}
ight)^{rac{2}{3}}$

Open Calculator

ex $175.3042 ext{m}^2=\sqrt{3}\cdot\left(rac{12\cdot120 ext{m}^3}{\sqrt{2}}
ight)^{rac{2}{3}}$

Volume of Tetrahedron

__

21) Volume of Tetrahedron

 $V=rac{l_{
m e}^3}{6\cdot\sqrt{2}}$ ex $117.8511{
m m}^3=rac{(10{
m m})^3}{6\cdot\sqrt{2}}$



Open Calculator

Open Calculator

Open Calculator

22) Volume of Tetrahedron given Face Area

$$extbf{K} V = rac{\left(rac{4\cdot ext{A}_{ ext{Face}}}{\sqrt{3}}
ight)^{rac{3}{2}}}{6\cdot \sqrt{2}}$$

ex
$$124.8537 \mathrm{m}^{_3} = rac{\left(rac{4\cdot45\mathrm{m}^{_2}}{\sqrt{3}}
ight)^{rac{3}{2}}}{6\cdot\sqrt{2}}$$

23) Volume of Tetrahedron given Height

$$ext{V} = rac{\left(\sqrt{rac{3}{2}}\cdot ext{h}
ight)^3}{6\cdot\sqrt{2}}$$

ex
$$110.8513 ext{m}^3=rac{\left(\sqrt{rac{3}{2}}\cdot 8 ext{m}
ight)^3}{6\cdot \sqrt{2}}$$

24) Volume of Tetrahedron given Total Surface Area

$$V = rac{\sqrt{2}}{12} \cdot \left(rac{ ext{TSA}}{\sqrt{3}}
ight)^{rac{3}{2}}$$

ex
$$114.5951 \mathrm{m}^{_3} = rac{\sqrt{2}}{12} \cdot \left(rac{170 \mathrm{m}^{_2}}{\sqrt{3}}
ight)^{rac{3}{2}}$$







Variables Used

- AFace Face Area of Tetrahedron (Square Meter)
- **h** Height of Tetrahedron (Meter)
- **I** Edge Length of Tetrahedron (Meter)
- r_c Circumsphere Radius of Tetrahedron (Meter)
- **r**_i Insphere Radius of Tetrahedron (Meter)
- rm Midsphere Radius of Tetrahedron (Meter)
- TSA Total Surface Area of Tetrahedron (Square Meter)
- **V** Volume of Tetrahedron (Cubic 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 (m³)

 Volume Unit Conversion
- Measurement: Area in Square Meter (m²)

 Area Unit Conversion





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- Octahedron Formulas
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