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Important Formulas of Heptagon

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List of 25 Important Formulas of Heptagon

Important Formulas of Heptagon

Area of Heptagon

1) Area of Heptagon

$$\text{fx } A = \frac{7 \cdot S^2}{4 \cdot \tan\left(\frac{\pi}{7}\right)}$$

[Open Calculator !\[\]\(de95854c7ee024cfadc48187bbb781b2_img.jpg\)](#)

$$\text{ex } 363.3912\text{m}^2 = \frac{7 \cdot (10\text{m})^2}{4 \cdot \tan\left(\frac{\pi}{7}\right)}$$

2) Area of Heptagon given Height

$$\text{fx } A = \frac{7}{4} \cdot \frac{\left(2 \cdot h \cdot \tan\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)\right)^2}{\tan\left(\frac{\pi}{7}\right)}$$

[Open Calculator !\[\]\(6a9b39b98eb945faa14c645ec99e4eaa_img.jpg\)](#)

$$\text{ex } 366.5022\text{m}^2 = \frac{7}{4} \cdot \frac{\left(2 \cdot 22\text{m} \cdot \tan\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)\right)^2}{\tan\left(\frac{\pi}{7}\right)}$$



3) Area of Heptagon given Perimeter

fx

$$A = \frac{7}{4} \cdot \frac{\left(\frac{P}{7}\right)^2}{\tan\left(\frac{\pi}{7}\right)}$$

[Open Calculator !\[\]\(a03a7eb2f4046e1d3c76772003e549ea_img.jpg\)](#)

ex

$$363.3912\text{m}^2 = \frac{7}{4} \cdot \frac{\left(\frac{70\text{m}}{7}\right)^2}{\tan\left(\frac{\pi}{7}\right)}$$

4) Area of Triangle of Heptagon given Inradius

fx

$$A_{\text{Triangle}} = \frac{1}{2} \cdot S \cdot r_i$$

[Open Calculator !\[\]\(4fe57c3593bf1b21d272ae7ac8dfaf77_img.jpg\)](#)

ex

$$55\text{m}^2 = \frac{1}{2} \cdot 10\text{m} \cdot 11\text{m}$$

Diagonal of Heptagon

5) Long Diagonal of Heptagon

fx

$$d_{\text{Long}} = \frac{S}{2 \cdot \sin\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$

[Open Calculator !\[\]\(28f72b996fc97883dfd9d4e8b1b16b4e_img.jpg\)](#)

ex

$$22.4698\text{m} = \frac{10\text{m}}{2 \cdot \sin\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$



6) Long Diagonal of Heptagon given Width

$$\text{fx } d_{\text{Long}} = \frac{W}{1}$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95_img.jpg\)](#)

$$\text{ex } 23\text{m} = \frac{23\text{m}}{1}$$

7) Short Diagonal of Heptagon

$$\text{fx } d_{\text{Short}} = 2 \cdot S \cdot \cos\left(\frac{\pi}{7}\right)$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2_img.jpg\)](#)

$$\text{ex } 18.01938\text{m} = 2 \cdot 10\text{m} \cdot \cos\left(\frac{\pi}{7}\right)$$

8) Short Diagonal of Heptagon given Perimeter

$$\text{fx } d_{\text{Short}} = 2 \cdot \left(\frac{P}{7}\right) \cdot \cos\left(\frac{\pi}{7}\right)$$

[Open Calculator !\[\]\(fe3aebe81acea8d45108cd2768939da7_img.jpg\)](#)

$$\text{ex } 18.01938\text{m} = 2 \cdot \left(\frac{70\text{m}}{7}\right) \cdot \cos\left(\frac{\pi}{7}\right)$$



Height of Heptagon

9) Height of Heptagon

$$\text{fx } h = \frac{S}{2 \cdot \tan\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$

[Open Calculator !\[\]\(74d4806277d7e73349d8e8c0897931e9_img.jpg\)](#)

$$\text{ex } 21.90643\text{m} = \frac{10\text{m}}{2 \cdot \tan\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$

10) Height of Heptagon given Perimeter

$$\text{fx } h = \frac{\frac{P}{7}}{2 \cdot \tan\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$

[Open Calculator !\[\]\(8bba887393ca45b761e5cb49e755e762_img.jpg\)](#)

$$\text{ex } 21.90643\text{m} = \frac{\frac{70\text{m}}{7}}{2 \cdot \tan\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$



11) Height of Heptagon given Width Open Calculator 

$$\text{fx } h = w \cdot \frac{\sin\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}{\tan\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$

$$\text{ex } 22.42334\text{m} = 23\text{m} \cdot \frac{\sin\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}{\tan\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$

Perimeter of Heptagon 12) Perimeter of Heptagon Open Calculator 

$$\text{fx } P = 7 \cdot S$$

$$\text{ex } 70\text{m} = 7 \cdot 10\text{m}$$

13) Perimeter of Heptagon given Circumradius Open Calculator 

$$\text{fx } P = 14 \cdot r_c \cdot \sin\left(\frac{\pi}{7}\right)$$

$$\text{ex } 72.89247\text{m} = 14 \cdot 12\text{m} \cdot \sin\left(\frac{\pi}{7}\right)$$



14) Perimeter of Heptagon given Inradius

$$\text{fx } P = 14 \cdot r_i \cdot \tan\left(\frac{\pi}{7}\right)$$

[Open Calculator !\[\]\(9dfdaff1d86ba3c1f8353b4d1b61b8c5_img.jpg\)](#)

$$\text{ex } 74.16249\text{m} = 14 \cdot 11\text{m} \cdot \tan\left(\frac{\pi}{7}\right)$$

Radius of Heptagon

15) Circumradius of Heptagon

$$\text{fx } r_c = \frac{S}{2 \cdot \sin\left(\frac{\pi}{7}\right)}$$

[Open Calculator !\[\]\(3cb60d42b10e53f9522bb0b392c1c4cd_img.jpg\)](#)

$$\text{ex } 11.52382\text{m} = \frac{10\text{m}}{2 \cdot \sin\left(\frac{\pi}{7}\right)}$$

16) Circumradius of Heptagon given Area

$$\text{fx } r_c = \frac{\sqrt{\frac{4 \cdot A \cdot \tan\left(\frac{\pi}{7}\right)}{7}}}{2 \cdot \sin\left(\frac{\pi}{7}\right)}$$

[Open Calculator !\[\]\(0d7ca0919e6c47bbd874bfa0189fe22e_img.jpg\)](#)

$$\text{ex } 11.5493\text{m} = \frac{\sqrt{\frac{4 \cdot 365\text{m}^2 \cdot \tan\left(\frac{\pi}{7}\right)}{7}}}{2 \cdot \sin\left(\frac{\pi}{7}\right)}$$



17) Inradius of Heptagon

$$\text{fx } r_i = \frac{S}{2 \cdot \tan\left(\frac{\pi}{7}\right)}$$

Open Calculator 

$$\text{ex } 10.38261\text{m} = \frac{10\text{m}}{2 \cdot \tan\left(\frac{\pi}{7}\right)}$$

18) Inradius of Heptagon given Area of Triangle

$$\text{fx } r_i = \frac{2 \cdot A_{\text{Triangle}}}{S}$$

Open Calculator 

$$\text{ex } 10\text{m} = \frac{2 \cdot 50\text{m}^2}{10\text{m}}$$

Side of Heptagon 19) Side of Heptagon given Area

$$\text{fx } S = \sqrt{\frac{4 \cdot A \cdot \tan\left(\frac{\pi}{7}\right)}{7}}$$

Open Calculator 

$$\text{ex } 10.02211\text{m} = \sqrt{\frac{4 \cdot 365\text{m}^2 \cdot \tan\left(\frac{\pi}{7}\right)}{7}}$$



20) Side of Heptagon given Area of Triangle and Inradius

$$\text{fx } S = \frac{2 \cdot A_{\text{Triangle}}}{r_i}$$

[Open Calculator !\[\]\(71ceb62b681518c82e95d615e7265d66_img.jpg\)](#)

$$\text{ex } 9.090909\text{m} = \frac{2 \cdot 50\text{m}^2}{11\text{m}}$$

21) Side of Heptagon given Circumradius

$$\text{fx } S = 2 \cdot r_c \cdot \sin\left(\frac{\pi}{7}\right)$$

[Open Calculator !\[\]\(fc3a57079704ef1b99671c8cafae23be_img.jpg\)](#)

$$\text{ex } 10.41321\text{m} = 2 \cdot 12\text{m} \cdot \sin\left(\frac{\pi}{7}\right)$$

22) Side of Heptagon given Height

$$\text{fx } S = 2 \cdot h \cdot \tan\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)$$

[Open Calculator !\[\]\(d5831b2ac75eb48b4c49d27e61d24c03_img.jpg\)](#)

$$\text{ex } 10.04271\text{m} = 2 \cdot 22\text{m} \cdot \tan\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)$$



Width of Heptagon

23) Width of Heptagon

$$\text{fx } w = \frac{S}{2 \cdot \sin\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$

[Open Calculator !\[\]\(4cafc60cd39da821525d7c6589540296_img.jpg\)](#)

$$\text{ex } 22.4698\text{m} = \frac{10\text{m}}{2 \cdot \sin\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$

24) Width of Heptagon given Area

$$\text{fx } w = \frac{\sqrt{\frac{4 \cdot \tan\left(\frac{\pi}{7}\right)}{7} \cdot A}}{2 \cdot \sin\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$

[Open Calculator !\[\]\(8a8ea273bba45b658cf4779d37ab61e8_img.jpg\)](#)

$$\text{ex } 22.51948\text{m} = \frac{\sqrt{\frac{4 \cdot \tan\left(\frac{\pi}{7}\right)}{7} \cdot 365\text{m}^2}}{2 \cdot \sin\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$

25) Width of Heptagon given Perimeter

$$\text{fx } w = \frac{P}{14 \cdot \sin\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$

[Open Calculator !\[\]\(07e95c4c760ed8b72579d140ce510c89_img.jpg\)](#)

$$\text{ex } 22.4698\text{m} = \frac{70\text{m}}{14 \cdot \sin\left(\frac{\left(\frac{\pi}{2}\right)}{7}\right)}$$



Variables Used

- **A** Area of Heptagon (Square Meter)
- **A_{Triangle}** Area of Triangle of Heptagon (Square Meter)
- **d_{Long}** Long Diagonal of Heptagon (Meter)
- **d_{Short}** Short Diagonal of Heptagon (Meter)
- **h** Height of Heptagon (Meter)
- **P** Perimeter of Heptagon (Meter)
- **r_c** Circumradius of Heptagon (Meter)
- **r_i** Inradius of Heptagon (Meter)
- **S** Side of Heptagon (Meter)
- **w** Width of Heptagon (Meter)



Constants, Functions, Measurements used

- **Constant:** **pi**, 3.14159265358979323846264338327950288
Archimedes' constant
- **Function:** **cos**, cos(Angle)
Trigonometric cosine function
- **Function:** **sin**, sin(Angle)
Trigonometric sine function
- **Function:** **sqrt**, sqrt(Number)
Square root function
- **Function:** **tan**, tan(Angle)
Trigonometric tangent function
- **Measurement:** **Length** in Meter (m)
Length Unit Conversion 
- **Measurement:** **Area** in Square Meter (m²)
Area Unit Conversion 



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