

Important Formulas of Hexadecagon PDF



Formulas
Examples
with Units

List of 26
Important Formulas of Hexadecagon

1) Area of Hexadecagon Formulas

1.1) Area of Hexadecagon Formula

Formula

$$A = 4 \cdot S^2 \cdot \cot\left(\frac{\pi}{16}\right)$$

Example with Units

$$502.7339 \text{ m}^2 = 4 \cdot 5 \text{ m}^2 \cdot \cot\left(\frac{3.1416}{16}\right)$$

Evaluate Formula 

1.2) Area of Hexadecagon given Height Formula

Formula

$$A = 4 \cdot h^2 \cdot \tan\left(\frac{\pi}{16}\right)$$

Example with Units

$$497.2809 \text{ m}^2 = 4 \cdot 25 \text{ m}^2 \cdot \tan\left(\frac{3.1416}{16}\right)$$

Evaluate Formula 

1.3) Area of Hexadecagon given Perimeter Formula

Formula

$$A = 4 \cdot \left(\frac{P}{16}\right)^2 \cdot \cot\left(\frac{\pi}{16}\right)$$

Example with Units

$$502.7339 \text{ m}^2 = 4 \cdot \left(\frac{80 \text{ m}}{16}\right)^2 \cdot \cot\left(\frac{3.1416}{16}\right)$$

Evaluate Formula 

2) Diagonal of Hexadecagon Formulas

2.1) Diagonal of Hexadecagon across Eight Sides Formula

Formula

$$d_8 = \frac{S}{\sin\left(\frac{\pi}{16}\right)}$$

Example with Units

$$25.6292 \text{ m} = \frac{5 \text{ m}}{\sin\left(\frac{3.1416}{16}\right)}$$

Evaluate Formula 

2.2) Diagonal of Hexadecagon across Five Sides Formula

Formula

$$d_5 = \frac{\sin\left(\frac{5 \cdot \pi}{16}\right)}{\sin\left(\frac{\pi}{16}\right)} \cdot S$$

Example with Units

$$21.3099 \text{ m} = \frac{\sin\left(\frac{5 \cdot 3.1416}{16}\right)}{\sin\left(\frac{3.1416}{16}\right)} \cdot 5 \text{ m}$$

Evaluate Formula 



2.3) Diagonal of Hexadecagon across Four Sides Formula

Formula

$$d_4 = \frac{S}{\sqrt{2} \cdot \sin\left(\frac{\pi}{16}\right)}$$

Example with Units

$$18.1225\text{m} = \frac{5\text{m}}{\sqrt{2} \cdot \sin\left(\frac{3.1416}{16}\right)}$$

Evaluate Formula 

2.4) Diagonal of Hexadecagon across Seven Sides Formula

Formula

$$d_7 = \frac{\sin\left(\frac{7 \cdot \pi}{16}\right)}{\sin\left(\frac{\pi}{16}\right)} \cdot S$$

Example with Units

$$25.1367\text{m} = \frac{\sin\left(\frac{7 \cdot 3.1416}{16}\right)}{\sin\left(\frac{3.1416}{16}\right)} \cdot 5\text{m}$$

Evaluate Formula 

2.5) Diagonal of Hexadecagon across Six Sides Formula

Formula

$$d_6 = \frac{\sin\left(\frac{3 \cdot \pi}{8}\right)}{\sin\left(\frac{\pi}{16}\right)} \cdot S$$

Example with Units

$$23.6783\text{m} = \frac{\sin\left(\frac{3 \cdot 3.1416}{8}\right)}{\sin\left(\frac{3.1416}{16}\right)} \cdot 5\text{m}$$

Evaluate Formula 

2.6) Diagonal of Hexadecagon across Three Sides Formula

Formula

$$d_3 = \frac{\sin\left(\frac{3 \cdot \pi}{16}\right)}{\sin\left(\frac{\pi}{16}\right)} \cdot S$$

Example with Units

$$14.2388\text{m} = \frac{\sin\left(\frac{3 \cdot 3.1416}{16}\right)}{\sin\left(\frac{3.1416}{16}\right)} \cdot 5\text{m}$$

Evaluate Formula 

2.7) Diagonal of Hexadecagon across Two Sides Formula

Formula

$$d_2 = \frac{\sin\left(\frac{\pi}{8}\right)}{\sin\left(\frac{\pi}{16}\right)} \cdot S$$

Example with Units

$$9.8079\text{m} = \frac{\sin\left(\frac{3.1416}{8}\right)}{\sin\left(\frac{3.1416}{16}\right)} \cdot 5\text{m}$$

Evaluate Formula 

3) Height of Hexadecagon Formulas

3.1) Height of Hexadecagon Formula

Formula

$$h = \frac{\sin\left(\frac{7 \cdot \pi}{16}\right)}{\sin\left(\frac{\pi}{16}\right)} \cdot S$$

Example with Units

$$25.1367\text{m} = \frac{\sin\left(\frac{7 \cdot 3.1416}{16}\right)}{\sin\left(\frac{3.1416}{16}\right)} \cdot 5\text{m}$$

Evaluate Formula 



3.2) Height of Hexadecagon given Area Formula ↻

Formula

$$h = \sqrt{\frac{A}{4 \cdot \tan\left(\frac{\pi}{16}\right)}}$$

Example with Units

$$25.0683 \text{ m} = \sqrt{\frac{500 \text{ m}^2}{4 \cdot \tan\left(\frac{3.1416}{16}\right)}}$$

Evaluate Formula ↻

3.3) Height of Hexadecagon given Diagonal across Seven Sides Formula ↻

Formula

$$h = \frac{d_7}{1}$$

Example with Units

$$25 \text{ m} = \frac{25 \text{ m}}{1}$$

Evaluate Formula ↻

3.4) Height of Hexadecagon given Inradius Formula ↻

Formula

$$h = 2 \cdot r_i$$

Example with Units

$$24 \text{ m} = 2 \cdot 12 \text{ m}$$

Evaluate Formula ↻

3.5) Height of Hexadecagon given Perimeter Formula ↻

Formula

$$h = \frac{\sin\left(\frac{7 \cdot \pi}{16}\right)}{\sin\left(\frac{\pi}{16}\right)} \cdot \frac{P}{16}$$

Example with Units

$$25.1367 \text{ m} = \frac{\sin\left(\frac{7 \cdot 3.1416}{16}\right)}{\sin\left(\frac{3.1416}{16}\right)} \cdot \frac{80 \text{ m}}{16}$$

Evaluate Formula ↻

4) Perimeter of Hexadecagon Formulas ↻

4.1) Perimeter of Hexadecagon Formula ↻

Formula

$$P = 16 \cdot S$$

Example with Units

$$80 \text{ m} = 16 \cdot 5 \text{ m}$$

Evaluate Formula ↻

4.2) Perimeter of Hexadecagon given Area Formula ↻

Formula

$$P = 16 \cdot \sqrt{\frac{A}{4 \cdot \cot\left(\frac{\pi}{16}\right)}}$$

Example with Units

$$79.7822 \text{ m} = 16 \cdot \sqrt{\frac{500 \text{ m}^2}{4 \cdot \cot\left(\frac{3.1416}{16}\right)}}$$

Evaluate Formula ↻

4.3) Perimeter of Hexadecagon given Height Formula ↻

Formula

$$P = 16 \cdot h \cdot \frac{\sin\left(\frac{\pi}{16}\right)}{\sin\left(\frac{7 \cdot \pi}{16}\right)}$$

Example with Units

$$79.5649 \text{ m} = 16 \cdot 25 \text{ m} \cdot \frac{\sin\left(\frac{3.1416}{16}\right)}{\sin\left(\frac{7 \cdot 3.1416}{16}\right)}$$

Evaluate Formula ↻



5) Radius of Hexadecagon Formulas

5.1) Circumradius of Hexadecagon Formula

Formula

Evaluate Formula 

$$r_c = \sqrt{\frac{4 + (2 \cdot \sqrt{2}) + \sqrt{20 + (14 \cdot \sqrt{2})}}{2}} \cdot S$$

Example with Units

$$12.8146\text{m} = \sqrt{\frac{4 + (2 \cdot \sqrt{2}) + \sqrt{20 + (14 \cdot \sqrt{2})}}{2}} \cdot 5\text{m}$$

5.2) Inradius of Hexadecagon Formula

Formula

Evaluate Formula 

$$r_i = \left(\frac{1 + \sqrt{2} + \sqrt{2 \cdot (2 + \sqrt{2})}}{2} \right) \cdot S$$

Example with Units

$$12.5683\text{m} = \left(\frac{1 + \sqrt{2} + \sqrt{2 \cdot (2 + \sqrt{2})}}{2} \right) \cdot 5\text{m}$$

5.3) Inradius of Hexadecagon given Height Formula

Formula

Example with Units

Evaluate Formula 

$$r_i = \frac{h}{2}$$

$$12.5\text{m} = \frac{25\text{m}}{2}$$

6) Side of Hexadecagon Formulas

6.1) Side of Hexadecagon given Area Formula

Formula

Example with Units

Evaluate Formula 

$$S = \sqrt{\frac{A}{4 \cdot \cot\left(\frac{\pi}{16}\right)}}$$

$$4.9864\text{m} = \sqrt{\frac{500\text{m}^2}{4 \cdot \cot\left(\frac{3.1416}{16}\right)}}$$



6.2) Side of Hexadecagon given Circumradius Formula

Formula

$$S = \frac{r_c}{\sqrt{\frac{4 + (2 \cdot \sqrt{2}) + \sqrt{20 + (14 \cdot \sqrt{2})}}{2}}}$$

Example with Units

$$5.0723\text{m} = \frac{13\text{m}}{\sqrt{\frac{4 + (2 \cdot \sqrt{2}) + \sqrt{20 + (14 \cdot \sqrt{2})}}{2}}}$$

Evaluate Formula 

6.3) Side of Hexadecagon given Height Formula

Formula

$$S = h \cdot \frac{\sin\left(\frac{\pi}{16}\right)}{\sin\left(\frac{7 \cdot \pi}{16}\right)}$$

Example with Units

$$4.9728\text{m} = 25\text{m} \cdot \frac{\sin\left(\frac{3.1416}{16}\right)}{\sin\left(\frac{7 \cdot 3.1416}{16}\right)}$$

Evaluate Formula 

6.4) Side of Hexadecagon given Inradius Formula

Formula

$$S = \frac{2 \cdot r_i}{1 + \sqrt{2} + \sqrt{2 \cdot (2 + \sqrt{2})}}$$

Example with Units

$$4.7739\text{m} = \frac{2 \cdot 12\text{m}}{1 + \sqrt{2} + \sqrt{2 \cdot (2 + \sqrt{2})}}$$

Evaluate Formula 

6.5) Side of Hexadecagon given Perimeter Formula

Formula

$$S = \frac{P}{16}$$

Example with Units

$$5\text{m} = \frac{80\text{m}}{16}$$



Evaluate Formula 













































Variables used in list of Important Formulas of Hexadecagon above

- **A** Area of Hexadecagon (Square Meter)
- **d₂** Diagonal across Two Sides of Hexadecagon (Meter)
- **d₃** Diagonal across Three Sides of Hexadecagon (Meter)
- **d₄** Diagonal across Four Sides of Hexadecagon (Meter)
- **d₅** Diagonal across Five Sides of Hexadecagon (Meter)
- **d₆** Diagonal across Six Sides of Hexadecagon (Meter)
- **d₇** Diagonal across Seven Sides of Hexadecagon (Meter)
- **d₈** Diagonal across Eight Sides of Hexadecagon (Meter)
- **h** Height of Hexadecagon (Meter)
- **P** Perimeter of Hexadecagon (Meter)
- **r_c** Circumradius of Hexadecagon (Meter)
- **r_i** Inradius of Hexadecagon (Meter)
- **S** Side of Hexadecagon (Meter)



Constants, Functions, Measurements used in list of Important Formulas of Hexadecagon above

- **constant(s):** π , 3.14159265358979323846264338327950288
Archimedes' constant
- **Functions:** **cot**, $\cot(\text{Angle})$
Cotangent is a trigonometric function that is defined as the ratio of the adjacent side to the opposite side in a right triangle.
- **Functions:** **sin**, $\sin(\text{Angle})$
Sine is a trigonometric function that describes the ratio of the length of the opposite side of a right triangle to the length of the hypotenuse.
- **Functions:** **sqrt**, $\text{sqrt}(\text{Number})$
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.
- **Functions:** **tan**, $\tan(\text{Angle})$
The tangent of an angle is a trigonometric ratio of the length of the side opposite an angle to the length of the side adjacent to an angle in a right triangle.
- **Measurement:** **Length** in Meter (m)
Length Unit Conversion 
- **Measurement:** **Area** in Square Meter (m²)
Area Unit Conversion 



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