



Important Formulas of Decagon

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Examples!

Conversions!

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List of 25 Important Formulas of Decagon

Important Formulas of Decagon

Area of Decagon 🗗

1) Area of Decagon

$$\mathbf{K} = rac{5}{2} \cdot \sqrt{5 + \left(2 \cdot \sqrt{5}
ight)} \cdot \mathrm{S}^2$$

Open Calculator 🗗

$$extbf{ex} 769.4209 ext{m}^2 = rac{5}{2} \cdot \sqrt{5 + \left(2 \cdot \sqrt{5}
ight)} \cdot \left(10 ext{m}
ight)^2$$

2) Area of Decagon given Circumradius

$$\mathbf{K} egin{aligned} \mathbf{A} = rac{5}{2} \cdot \sqrt{5 + \left(2 \cdot \sqrt{5}
ight)} \cdot \left(rac{2 \cdot \mathrm{r_c}}{1 + \sqrt{5}}
ight)^2 \end{aligned}$$

$$extbf{ex} 752.3651 ext{m}^2 = rac{5}{2} \cdot \sqrt{5 + \left(2 \cdot \sqrt{5}
ight)} \cdot \left(rac{2 \cdot 16 ext{m}}{1 + \sqrt{5}}
ight)^2$$



3) Area of Decagon given Perimeter

Open Calculator 🚰

$$\mathbf{fx} \mathbf{A} = \frac{5}{2} \cdot \sqrt{5 + \left(2 \cdot \sqrt{5}\right) \cdot \left(\frac{\mathrm{P}}{10}\right)^2}$$

$$\mathbf{ex} \mathbf{769.4209m^2} = \frac{5}{2} \cdot \sqrt{5 + \left(2 \cdot \sqrt{5}\right) \cdot \left(\frac{100\mathrm{m}}{10}\right)^2}$$

4) Diagonal of Decagon across Five Sides

fx $d_5 = \left(1+\sqrt{5}\right)\cdot S$ ex $32.36068 \mathrm{m} = \left(1+\sqrt{5}\right)\cdot 10 \mathrm{m}$

Open Calculator 🖸

5) Diagonal of Decagon across Five Sides given Circumradius

o, Diagonal of Decayon across 1 ive sides given on cumulatius

ex $32\mathrm{m} = 2\cdot16\mathrm{m}$

fx $d_5 = 2 \cdot r_c$

Open Calculator

6) Diagonal of Decagon across Four Sides

$$ag{d}_4 = \sqrt{5 + \left(2 \cdot \sqrt{5}
ight)} \cdot ext{S}$$

$$\mathbf{ex}$$
 $30.77684\mathrm{m} = \sqrt{5 + \left(2 \cdot \sqrt{5}
ight)} \cdot 10\mathrm{m}$





- 7) Diagonal of Decagon across Four Sides given Inradius
 - Open Calculator

 $\mathrm{d_4} = (2\cdot\mathrm{r_i})$

- 8) Diagonal of Decagon across Three Sides
- $\left| \mathrm{d}_3 = rac{\sqrt{14 + \left(6 \cdot \sqrt{5}
 ight)}}{2} \cdot \mathrm{S}
 ight|$

Open Calculator

- \mathbf{ex} $26.18034\mathrm{m} = rac{\sqrt{14 + \left(6 \cdot \sqrt{5}
 ight)}}{2} \cdot 10\mathrm{m}$
- 9) Diagonal of Decagon across Two Sides
- $extbf{d}_2 = rac{\sqrt{10 + \left(2 \cdot \sqrt{5}
 ight)}}{2} \cdot ext{S}$



Height of Decagon G

10) Height of Decagon

$$\mathbf{h} = \sqrt{5 + \left(2 \cdot \sqrt{5}\right) \cdot \mathbf{S}}$$

Open Calculator 🗗

 $oxed{\mathbf{ex}}30.77684\mathrm{m} = \sqrt{5+\left(2\cdot\sqrt{5}
ight)\cdot10\mathrm{m}}$

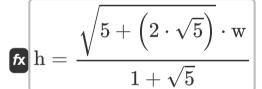
11) Height of Decagon given Diagonal across Four Sides

fx $|\mathbf{h}=\mathbf{d}_4\cdot \mathbf{1}|$

Open Calculator

 $\mathbf{ex} \ 31\mathrm{m} = 31\mathrm{m} \cdot 1$

12) Height of Decagon given Width





Perimeter of Decagon 🗗

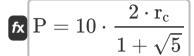
13) Perimeter of Decagon

fx
$$P=10\cdot S$$

Open Calculator 🚰

$$ex 100m = 10 \cdot 10m$$

14) Perimeter of Decagon given Circumradius



Open Calculator

15) Perimeter of Decagon given Height

$$ext{P} = 10 \cdot rac{ ext{h}}{\sqrt{5 + \left(2 \cdot \sqrt{5}
ight)}}$$

ex
$$100.7251 \mathrm{m} = 10 \cdot \frac{31 \mathrm{m}}{\sqrt{5 + \left(2 \cdot \sqrt{5}\right)}}$$





Radius of Decagon

16) Circumradius of Decagon

 $\mathbf{f}_{\mathrm{c}} = rac{1+\sqrt{5}}{2} \cdot \mathrm{S}$

Open Calculator 🗗

ex $16.18034 \mathrm{m} = rac{1+\sqrt{5}}{2} \cdot 10 \mathrm{m}$

17) Circumradius of Decagon given Width

 $\mathbf{f}\mathbf{x}$ $\mathbf{r}_{\mathrm{c}}=rac{\mathrm{w}}{2}$

Open Calculator 🖸

 $\boxed{16m = \frac{32m}{2}}$

18) Inradius of Decagon 🛂

 $\mathbf{r}_{\mathrm{i}} = rac{\sqrt{5 + \left(2 \cdot \sqrt{5}
ight)}}{2} \cdot \mathbf{S}$

Open Calculator

 $oxed{ex} 15.38842 \mathrm{m} = rac{\sqrt{5 + \left(2 \cdot \sqrt{5}
ight)}}{2} \cdot 10 \mathrm{m}$



19) Inradius of Decagon given Height 🗗

h

Open Calculator

 $\boxed{15.5\text{m} = \frac{31\text{m}}{2}}$

Side of Decagon 2

20) Side of Decagon given Area

$$extbf{S} = \sqrt{rac{2 \cdot ext{A}}{5 \cdot \sqrt{5 + \left(2 \cdot \sqrt{5}
ight)}}}$$

Open Calculator

ex
$$10.00376 \mathrm{m} = \sqrt{rac{2 \cdot 770 \mathrm{m}^2}{5 \cdot \sqrt{5 + \left(2 \cdot \sqrt{5}
ight)}}}$$

21) Side of Decagon given Circumradius

$$ext{S} = rac{2 \cdot ext{r}_{ ext{c}}}{1 + \sqrt{5}}$$

Open Calculator 🗗

 $= \frac{2 \cdot 16 \text{m}}{1 + \sqrt{5}}$





22) Side of Decagon given Width 🗗

$$S = w \cdot \sin\left(\frac{\pi}{10}\right)$$

Open Calculator

$$9.888544m = 32m \cdot \sin\left(\frac{\pi}{10}\right)$$

Width of Decagon G

23) Width of Decagon

$$\mathbf{f}\mathbf{x} = rac{\mathrm{S}}{\sin\left(rac{\pi}{10}
ight)}$$

Open Calculator 2

24) Width of Decagon given Area 🛂

$$\mathbf{w} = \left(1 + \sqrt{5}\right) \cdot \sqrt{\frac{2 \cdot \mathbf{A}}{5 \cdot \sqrt{5 + \left(2 \cdot \sqrt{5}\right)}}}$$

ex
$$32.37286\mathrm{m} = \left(1+\sqrt{5}\right)\cdot\sqrt{rac{2\cdot770\mathrm{m}^2}{5\cdot\sqrt{5+\left(2\cdot\sqrt{5}\right)}}}$$

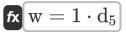




25) Width of Decagon given Diagonal across Five Sides



Open Calculator 🗗



 $\boxed{\textbf{ex} \ 32\text{m} = 1 \cdot 32\text{m}}$





Variables Used

- A Area of Decagon (Square Meter)
- d₂ Diagonal across Two Sides of Decagon (Meter)
- d₃ Diagonal across Three Sides of Decagon (Meter)
- d₄ Diagonal across Four Sides of Decagon (Meter)
- d₅ Diagonal across Five Sides of Decagon (Meter)
- **h** Height of Decagon (Meter)
- P Perimeter of Decagon (Meter)
- **r**_c Circumradius of Decagon (Meter)
- **r**_i Inradius of Decagon (Meter)
- S Side of Decagon (Meter)
- w Width of Decagon (Meter)





Constants, Functions, Measurements used

- Constant: pi, 3.14159265358979323846264338327950288
 Archimedes' constant
- Function: sin, sin(Angle)

 Trigonometric sine function
- Function: sqrt, sqrt(Number) Square root function
- Measurement: Length in Meter (m)

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

 Area Unit Conversion





Check other formula lists

- Annulus Formulas
- Antiparallelogram Formulas
- Arrow Hexagon Formulas
- Astroid Formulas
- Bulge Formulas
- Cardioid Formulas
- Circular Arc Quadrangle
 Formulas
- Concave Pentagon Formulas
- Concave Quadrilateral Formulas
- Concave Regular Hexagon
 Formulas
- Concave Regular Pentagon
 Formulas
- Crossed Rectangle Formulas
- Cut Rectangle Formulas
- Cyclic Quadrilateral Formulas
- Cycloid Formulas
- Decagon Formulas
- Dodecagon Formulas
- Double Cycloid Formulas
- Fourstar Formulas
- Frame Formulas
- Golden Rectangle Formulas 🗗
- Grid Formulas
- H Shape Formulas

- Half Yin-Yang Formulas
- Heart Shape Formulas
- Hendecagon Formulas
- Heptagon Formulas
- Hexadecagon Formulas
- Hexagon Formulas
- Hexagram Formulas 💪
- House Shape Formulas
- Hyperbola Formulas
- Hypocycloid Formulas
- Isosceles Trapezoid Formulas
- Koch Curve Formulas
- L Shape Formulas
- Line Formulas
- Lune Formulas
- N-gon Formulas
- Nonagon Formulas
- Octagon Formulas
- Octagram Formulas
- Open Frame Formulas
- Parallelogram Formulas
- Pentagon Formulas
- Pentagram Formulas
- Polygram Formulas
- Quadrilateral Formulas
- Quarter Circle Formulas
- Rectangle Formulas





- Rectangular Hexagon
 Formulas
- Regular Polygon Formulas
- Reuleaux Triangle Formulas
- Rhombus Formulas
- Right Trapezoid Formulas
- Round Corner Formulas
- Salinon Formulas
- Semicircle Formulas
- Sharp Kink Formulas
- Square Formulas

- Star of Lakshmi Formulas 🗗
- Stretched Hexagon Formulas
- T Shape Formulas
- Tangential Quadrilateral Formulas
- Trapezoid Formulas
- Tricorn Formulas
- Tri-equilateral Trapezoid
 Formulas
- Truncated Square Formulas
- Unicursal Hexagram Formulas 🗗
- X Shape Formulas

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