

Important Formulas of Decagon PDF



Formulas Examples with Units

List of 25 Important Formulas of Decagon

1) Area of Decagon Formulas ↻

1.1) Area of Decagon Formula ↻

Formula

$$A = \frac{5}{2} \cdot \sqrt{5 + (2 \cdot \sqrt{5})} \cdot s^2$$

Example with Units

$$769.4209 \text{ m}^2 = \frac{5}{2} \cdot \sqrt{5 + (2 \cdot \sqrt{5})} \cdot 10 \text{ m}^2$$

Evaluate Formula ↻

1.2) Area of Decagon given Circumradius Formula ↻

Formula

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

Example with Units

$$752.3651 \text{ m}^2 = \frac{5}{2} \cdot \sqrt{5 + (2 \cdot \sqrt{5})} \cdot \left(\frac{2 \cdot 16 \text{ m}}{1 + \sqrt{5}} \right)^2$$

Evaluate Formula ↻

1.3) Area of Decagon given Perimeter Formula ↻

Formula

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

Example with Units

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

Evaluate Formula ↻

2) Diagonal of Decagon Formulas ↻

2.1) Diagonal of Decagon across Five Sides Formula ↻

Formula

$$d_5 = (1 + \sqrt{5}) \cdot s$$

Example with Units

$$32.3607 \text{ m} = (1 + \sqrt{5}) \cdot 10 \text{ m}$$

Evaluate Formula ↻

2.2) Diagonal of Decagon across Five Sides given Circumradius Formula ↻

Formula

$$d_5 = 2 \cdot r_c$$

Example with Units

$$32 \text{ m} = 2 \cdot 16 \text{ m}$$

Evaluate Formula ↻



2.3) Diagonal of Decagon across Four Sides Formula

Formula

$$d_4 = \sqrt{5 + (2 \cdot \sqrt{5})} \cdot S$$

Example with Units

$$30.7768_{\text{m}} = \sqrt{5 + (2 \cdot \sqrt{5})} \cdot 10_{\text{m}}$$

Evaluate Formula 

2.4) Diagonal of Decagon across Four Sides given Inradius Formula

Formula

$$d_4 = (2 \cdot r_i)$$

Example with Units

$$30_{\text{m}} = (2 \cdot 15_{\text{m}})$$

Evaluate Formula 

2.5) Diagonal of Decagon across Three Sides Formula

Formula

$$d_3 = \frac{\sqrt{14 + (6 \cdot \sqrt{5})}}{2} \cdot S$$

Example with Units

$$26.1803_{\text{m}} = \frac{\sqrt{14 + (6 \cdot \sqrt{5})}}{2} \cdot 10_{\text{m}}$$

Evaluate Formula 

2.6) Diagonal of Decagon across Two Sides Formula

Formula

$$d_2 = \frac{\sqrt{10 + (2 \cdot \sqrt{5})}}{2} \cdot S$$

Example with Units

$$19.0211_{\text{m}} = \frac{\sqrt{10 + (2 \cdot \sqrt{5})}}{2} \cdot 10_{\text{m}}$$

Evaluate Formula 

3) Height of Decagon Formulas

3.1) Height of Decagon Formula

Formula

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

Example with Units

$$30.7768_{\text{m}} = \sqrt{5 + (2 \cdot \sqrt{5})} \cdot 10_{\text{m}}$$

Evaluate Formula 

3.2) Height of Decagon given Diagonal across Four Sides Formula

Formula

$$h = d_4 \cdot 1$$

Example with Units

$$31_{\text{m}} = 31_{\text{m}} \cdot 1$$

Evaluate Formula 

3.3) Height of Decagon given Width Formula

Formula

$$h = \frac{\sqrt{5 + (2 \cdot \sqrt{5})} \cdot w}{1 + \sqrt{5}}$$

Example with Units

$$30.4338_{\text{m}} = \frac{\sqrt{5 + (2 \cdot \sqrt{5})} \cdot 32_{\text{m}}}{1 + \sqrt{5}}$$

Evaluate Formula 



4) Perimeter of Decagon Formulas ↺

4.1) Perimeter of Decagon Formula ↺

Formula

$$P = 10 \cdot S$$

Example with Units

$$100_{\text{m}} = 10 \cdot 10_{\text{m}}$$

Evaluate Formula ↺

4.2) Perimeter of Decagon given Circumradius Formula ↺

Formula

$$P = 10 \cdot \frac{2 \cdot r_c}{1 + \sqrt{5}}$$

Example with Units

$$98.8854_{\text{m}} = 10 \cdot \frac{2 \cdot 16_{\text{m}}}{1 + \sqrt{5}}$$

Evaluate Formula ↺

4.3) Perimeter of Decagon given Height Formula ↺

Formula

$$P = 10 \cdot \frac{h}{\sqrt{5 + (2 \cdot \sqrt{5})}}$$

Example with Units

$$100.7251_{\text{m}} = 10 \cdot \frac{31_{\text{m}}}{\sqrt{5 + (2 \cdot \sqrt{5})}}$$

Evaluate Formula ↺

5) Radius of Decagon Formulas ↺

5.1) Circumradius of Decagon Formula ↺

Formula

$$r_c = \frac{1 + \sqrt{5}}{2} \cdot S$$

Example with Units

$$16.1803_{\text{m}} = \frac{1 + \sqrt{5}}{2} \cdot 10_{\text{m}}$$

Evaluate Formula ↺

5.2) Circumradius of Decagon given Width Formula ↺

Formula

$$r_c = \frac{w}{2}$$

Example with Units

$$16_{\text{m}} = \frac{32_{\text{m}}}{2}$$

Evaluate Formula ↺

5.3) Inradius of Decagon Formula ↺

Formula

$$r_i = \frac{\sqrt{5 + (2 \cdot \sqrt{5})}}{2} \cdot S$$

Example with Units

$$15.3884_{\text{m}} = \frac{\sqrt{5 + (2 \cdot \sqrt{5})}}{2} \cdot 10_{\text{m}}$$

Evaluate Formula ↺

5.4) Inradius of Decagon given Height Formula ↺

Formula

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

Example with Units

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

Evaluate Formula ↺



6) Side of Decagon Formulas ↻

6.1) Side of Decagon given Area Formula ↻

Formula

$$S = \sqrt{\frac{2 \cdot A}{5 \cdot \sqrt{5 + (2 \cdot \sqrt{5})}}}$$

Example with Units

$$10.0038\text{ m} = \sqrt{\frac{2 \cdot 770\text{ m}^2}{5 \cdot \sqrt{5 + (2 \cdot \sqrt{5})}}}$$

Evaluate Formula ↻

6.2) Side of Decagon given Circumradius Formula ↻

Formula

$$S = \frac{2 \cdot r_c}{1 + \sqrt{5}}$$

Example with Units

$$9.8885\text{ m} = \frac{2 \cdot 16\text{ m}}{1 + \sqrt{5}}$$

Evaluate Formula ↻

6.3) Side of Decagon given Width Formula ↻

Formula

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

Example with Units

$$9.8885\text{ m} = 32\text{ m} \cdot \sin\left(\frac{3.1416}{10}\right)$$

Evaluate Formula ↻

7) Width of Decagon Formulas ↻

7.1) Width of Decagon Formula ↻

Formula

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

Example with Units

$$32.3607\text{ m} = \frac{10\text{ m}}{\sin\left(\frac{3.1416}{10}\right)}$$

Evaluate Formula ↻

7.2) Width of Decagon given Area Formula ↻

Formula

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

Example with Units

$$32.3729\text{ m} = (1 + \sqrt{5}) \cdot \sqrt{\frac{2 \cdot 770\text{ m}^2}{5 \cdot \sqrt{5 + (2 \cdot \sqrt{5})}}}$$

Evaluate Formula ↻

7.3) Width of Decagon given Diagonal across Five Sides Formula ↻

Formula

$$w = 1 \cdot d_5$$

Example with Units

$$32\text{ m} = 1 \cdot 32\text{ m}$$

Evaluate Formula ↻



Variables used in list of Important Formulas of Decagon above

- **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 in list of Important Formulas of Decagon above

- **constant(s):** pi, 3.14159265358979323846264338327950288
Archimedes' constant
- **Functions:** sin, sin(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, sqrt(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.
- **Measurement:** Length in Meter (m)
Length Unit Conversion 
- **Measurement:** Area in Square Meter (m²)
Area Unit Conversion 



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