

Important Formulas of Dodecagon PDF



Formulas Examples with Units

List of 32 Important Formulas of Dodecagon

1) Area of Dodecagon Formulas

1.1) Area of Dodecagon Formula

Formula

$$A = 3 \cdot (2 + \sqrt{3}) \cdot s^2$$

Example with Units

$$1119.6152 \text{ m}^2 = 3 \cdot (2 + \sqrt{3}) \cdot 10 \text{ m}^2$$

Evaluate Formula 

1.2) Area of Dodecagon given Circumradius Formula

Formula

$$A = 3 \cdot r_c^2$$

Example with Units

$$1200 \text{ m}^2 = 3 \cdot 20 \text{ m}^2$$

Evaluate Formula 

1.3) Area of Dodecagon given Height Formula

Formula

$$A = \frac{3 \cdot h^2}{2 + \sqrt{3}}$$

Example with Units

$$1100.4673 \text{ m}^2 = \frac{3 \cdot 37 \text{ m}^2}{2 + \sqrt{3}}$$

Evaluate Formula 

1.4) Area of Dodecagon given Width Formula

Formula

$$A = 3 \cdot \frac{w^2}{2 + \sqrt{3}}$$

Example with Units

$$1100.4673 \text{ m}^2 = 3 \cdot \frac{37 \text{ m}^2}{2 + \sqrt{3}}$$

Evaluate Formula 

2) Diagonal of Dodecagon Formulas

2.1) Diagonal of Dodecagon across Five Sides Formula

Formula

$$d_5 = (2 + \sqrt{3}) \cdot s$$

Example with Units

$$37.3205 \text{ m} = (2 + \sqrt{3}) \cdot 10 \text{ m}$$

Evaluate Formula 

2.2) Diagonal of Dodecagon across Five Sides given Height Formula

Formula

$$d_5 = \frac{h}{1}$$

Example with Units

$$37 \text{ m} = \frac{37 \text{ m}}{1}$$

Evaluate Formula 



2.3) Diagonal of Dodecagon across Five Sides given Width Formula

Formula

$$d_5 = \frac{w}{1}$$

Example with Units

$$37\text{ m} = \frac{37\text{ m}}{1}$$

Evaluate Formula 

2.4) Diagonal of Dodecagon across Four Sides Formula

Formula

$$d_4 = \frac{(3 \cdot \sqrt{2}) + \sqrt{6}}{2} \cdot S$$

Example with Units

$$33.4607\text{ m} = \frac{(3 \cdot \sqrt{2}) + \sqrt{6}}{2} \cdot 10\text{ m}$$

Evaluate Formula 

2.5) Diagonal of Dodecagon across Six Sides Formula

Formula

$$d_6 = (\sqrt{6} + \sqrt{2}) \cdot S$$

Example with Units

$$38.637\text{ m} = (\sqrt{6} + \sqrt{2}) \cdot 10\text{ m}$$

Evaluate Formula 

2.6) Diagonal of Dodecagon across Three Sides Formula

Formula

$$d_3 = (\sqrt{3} + 1) \cdot S$$

Example with Units

$$27.3205\text{ m} = (\sqrt{3} + 1) \cdot 10\text{ m}$$

Evaluate Formula 

2.7) Diagonal of Dodecagon across Two Sides Formula

Formula

$$d_2 = \frac{\sqrt{2} + \sqrt{6}}{2} \cdot S$$

Example with Units

$$19.3185\text{ m} = \frac{\sqrt{2} + \sqrt{6}}{2} \cdot 10\text{ m}$$

Evaluate Formula 

3) Height of Dodecagon Formulas

3.1) Height of Dodecagon Formula

Formula

$$h = (2 + \sqrt{3}) \cdot S$$

Example with Units

$$37.3205\text{ m} = (2 + \sqrt{3}) \cdot 10\text{ m}$$

Evaluate Formula 

3.2) Height of Dodecagon given Area Formula

Formula

$$h = \sqrt{\frac{(2 + \sqrt{3}) \cdot A}{3}}$$

Example with Units

$$37.3269\text{ m} = \sqrt{\frac{(2 + \sqrt{3}) \cdot 1120\text{ m}^2}{3}}$$

Evaluate Formula 

3.3) Height of Dodecagon given Inradius Formula

Formula

$$h = 2 \cdot r_i$$

Example with Units

$$38\text{ m} = 2 \cdot 19\text{ m}$$

Evaluate Formula 



4) Perimeter of Dodecagon Formulas ↗

4.1) Perimeter of Dodecagon Formula ↗

Formula

$$P = 12 \cdot S$$

Example with Units

$$120\text{ m} = 12 \cdot 10\text{ m}$$

Evaluate Formula ↗

4.2) Perimeter of Dodecagon given Area Formula ↗

Formula

$$P = 12 \cdot \sqrt{\frac{A}{3 \cdot (2 + \sqrt{3})}}$$

Example with Units

$$120.0206\text{ m} = 12 \cdot \sqrt{\frac{1120\text{ m}^2}{3 \cdot (2 + \sqrt{3})}}$$

Evaluate Formula ↗

4.3) Perimeter of Dodecagon given Inradius Formula ↗

Formula

$$P = 12 \cdot \frac{r_i}{\frac{2 + \sqrt{3}}{2}}$$

Example with Units

$$122.1848\text{ m} = 12 \cdot \frac{19\text{ m}}{\frac{2 + \sqrt{3}}{2}}$$

Evaluate Formula ↗

5) Radius of Dodecagon Formulas ↗

5.1) Circumradius of Dodecagon Formula ↗

Formula

$$r_c = \frac{\sqrt{6} + \sqrt{2}}{2} \cdot S$$

Example with Units

$$19.3185\text{ m} = \frac{\sqrt{6} + \sqrt{2}}{2} \cdot 10\text{ m}$$

Evaluate Formula ↗

5.2) Circumradius of Dodecagon given Diagonal across Two Sides Formula ↗

Formula

$$r_c = \frac{d_2}{1}$$

Example with Units

$$20\text{ m} = \frac{20\text{ m}}{1}$$

Evaluate Formula ↗

5.3) Circumradius of Dodecagon given Perimeter Formula ↗

Formula

$$r_c = \frac{\sqrt{6} + \sqrt{2}}{24} \cdot P$$

Example with Units

$$19.3185\text{ m} = \frac{\sqrt{6} + \sqrt{2}}{24} \cdot 120\text{ m}$$

Evaluate Formula ↗

5.4) Circumradius of Dodecagon given Width Formula ↗

Formula

$$r_c = \frac{\sqrt{6} + \sqrt{2}}{2} \cdot \frac{w}{2 + \sqrt{3}}$$

Example with Units

$$19.1526\text{ m} = \frac{\sqrt{6} + \sqrt{2}}{2} \cdot \frac{37\text{ m}}{2 + \sqrt{3}}$$

Evaluate Formula ↗



5.5) Inradius of Dodecagon Formula ↻

Formula

$$r_i = \frac{2 + \sqrt{3}}{2} \cdot S$$

Example with Units

$$18.6603\text{ m} = \frac{2 + \sqrt{3}}{2} \cdot 10\text{ m}$$

Evaluate Formula ↻

5.6) Inradius of Dodecagon given Height Formula ↻

Formula

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

Example with Units

$$18.5\text{ m} = \frac{37\text{ m}}{2}$$

Evaluate Formula ↻

5.7) Inradius of Dodecagon given Perimeter Formula ↻

Formula

$$r_i = \frac{2 + \sqrt{3}}{24} \cdot P$$

Example with Units

$$18.6603\text{ m} = \frac{2 + \sqrt{3}}{24} \cdot 120\text{ m}$$

Evaluate Formula ↻

5.8) Inradius of Dodecagon given Width Formula ↻

Formula

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

Example with Units

$$18.5\text{ m} = \frac{37\text{ m}}{2}$$

Evaluate Formula ↻

6) Side of Dodecagon Formulas ↻

6.1) Side of Dodecagon given Area Formula ↻

Formula

$$S = \sqrt{\frac{A}{3 \cdot (2 + \sqrt{3})}}$$

Example with Units

$$10.0017\text{ m} = \sqrt{\frac{1120\text{ m}^2}{3 \cdot (2 + \sqrt{3})}}$$

Evaluate Formula ↻

6.2) Side of Dodecagon given Circumradius Formula ↻

Formula

$$S = \frac{r_c}{\frac{\sqrt{6} + \sqrt{2}}{2}}$$

Example with Units

$$10.3528\text{ m} = \frac{20\text{ m}}{\frac{\sqrt{6} + \sqrt{2}}{2}}$$

Evaluate Formula ↻

6.3) Side of Dodecagon given Height Formula ↻

Formula

$$S = \frac{h}{2 + \sqrt{3}}$$

Example with Units

$$9.9141\text{ m} = \frac{37\text{ m}}{2 + \sqrt{3}}$$

Evaluate Formula ↻



6.4) Side of Dodecagon given Perimeter Formula ↗

Formula

$$S = \frac{P}{12}$$

Example with Units

$$10_{\text{m}} = \frac{120_{\text{m}}}{12}$$

Evaluate Formula ↗

7) Width of Dodecagon Formulas ↗

7.1) Width of Dodecagon Formula ↗

Formula

$$w = (2 + \sqrt{3}) \cdot S$$

Example with Units

$$37.3205_{\text{m}} = (2 + \sqrt{3}) \cdot 10_{\text{m}}$$

Evaluate Formula ↗

7.2) Width of Dodecagon given Area Formula ↗

Formula

$$w = \sqrt{\frac{(2 + \sqrt{3}) \cdot A}{3}}$$

Example with Units

$$37.3269_{\text{m}} = \sqrt{\frac{(2 + \sqrt{3}) \cdot 1120_{\text{m}^2}}{3}}$$

Evaluate Formula ↗

7.3) Width of Dodecagon given Inradius Formula ↗

Formula

$$w = 2 \cdot r_i$$

Example with Units

$$38_{\text{m}} = 2 \cdot 19_{\text{m}}$$

Evaluate Formula ↗



Variables used in list of Important Formulas of Dodecagon above

- **A** Area of Dodecagon (Square Meter)
- **d₂** Diagonal Across Two Sides of Dodecagon (Meter)
- **d₃** Diagonal Across Three Sides of Dodecagon (Meter)
- **d₄** Diagonal Across Four Sides of Dodecagon (Meter)
- **d₅** Diagonal Across Five Sides of Dodecagon (Meter)
- **d₆** Diagonal Across Six Sides of Dodecagon (Meter)
- **h** Height of Dodecagon (Meter)
- **P** Perimeter of Dodecagon (Meter)
- **r_c** Circumradius of Dodecagon (Meter)
- **r_i** Inradius of Dodecagon (Meter)
- **S** Side of Dodecagon (Meter)
- **w** Width of Dodecagon (Meter)

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

- **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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