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Important Formulas of Dodecagon

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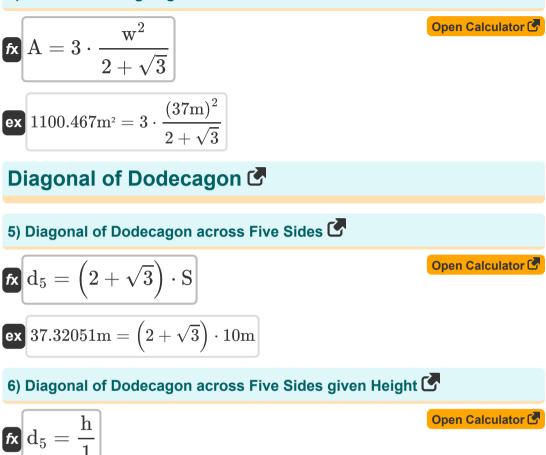
List of 32 Important Formulas of Dodecagon

Important Formulas of Dodecagon 🔗

Area of Dodecagon 🔗

1) Area of Dodecagon 🔗

fx $A = 3 \cdot \left(2 + \sqrt{3}\right) \cdot S^2$

Open Calculator 🔗

ex $1119.615\text{m}^2 = 3 \cdot \left(2 + \sqrt{3}\right) \cdot (10\text{m})^2$

2) Area of Dodecagon given Circumradius 🔗

fx $A = 3 \cdot r_c^2$

Open Calculator 🔗

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

3) Area of Dodecagon given Height 🔗

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

Open Calculator 🔗

ex $1100.467\text{m}^2 = \dfrac{3 \cdot (37\text{m})^2}{2 + \sqrt{3}}$

4) Area of Dodecagon given Width

Open Calculator

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

$$ex \quad 1100.467 m^2 = 3 \cdot \frac{(37m)^2}{2 + \sqrt{3}}$$

Diagonal of Dodecagon

5) Diagonal of Dodecagon across Five Sides

Open Calculator

$$fx \quad d_5 = \left(2 + \sqrt{3}\right) \cdot S$$

$$ex \quad 37.32051m = \left(2 + \sqrt{3}\right) \cdot 10m$$

6) Diagonal of Dodecagon across Five Sides given Height

Open Calculator

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

$$ex \quad 37m = \frac{37m}{1}$$

7) Diagonal of Dodecagon across Five Sides given Width ⤤

Open Calculator ⏻

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

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

8) Diagonal of Dodecagon across Four Sides ⤤

Open Calculator ⏻

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

ex $$33.46065m = \frac{\left(3 \cdot \sqrt{2}\right) + \sqrt{6}}{2} \cdot 10m$$

9) Diagonal of Dodecagon across Six Sides ⤤

Open Calculator ⏻

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

ex $$38.63703m = \left(\sqrt{6} + \sqrt{2}\right) \cdot 10m$$

10) Diagonal of Dodecagon across Three Sides ⤤

Open Calculator ⏻

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

ex $$27.32051m = \left(\sqrt{3} + 1\right) \cdot 10m$$

11) Diagonal of Dodecagon across Two Sides 🔗

Open Calculator 🔗

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

ex $19.31852m = \dfrac{\sqrt{2} + \sqrt{6}}{2} \cdot 10m$

Height of Dodecagon 🔗

12) Height of Dodecagon 🔗

Open Calculator 🔗

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

ex $37.32051m = \left(2 + \sqrt{3}\right) \cdot 10m$

13) Height of Dodecagon given Area 🔗

Open Calculator 🔗

fx $h = \sqrt{\dfrac{\left(2 + \sqrt{3}\right) \cdot A}{3}}$

ex $37.32692m = \sqrt{\dfrac{\left(2 + \sqrt{3}\right) \cdot 1120m^2}{3}}$

14) Height of Dodecagon given Inradius 🗗

fx $\boxed{h = 2 \cdot r_i}$

ex $\boxed{38m = 2 \cdot 19m}$

Perimeter of Dodecagon 🗗

15) Perimeter of Dodecagon 🗗

fx $\boxed{P = 12 \cdot S}$

ex $\boxed{120m = 12 \cdot 10m}$

16) Perimeter of Dodecagon given Area 🗗

fx $\boxed{P = 12 \cdot \sqrt{\dfrac{A}{3 \cdot \left(2 + \sqrt{3}\right)}}}$

ex $\boxed{120.0206m = 12 \cdot \sqrt{\dfrac{1120m^2}{3 \cdot \left(2 + \sqrt{3}\right)}}}$

17) Perimeter of Dodecagon given Inradius 🗗

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

ex $\boxed{122.1848m = 12 \cdot \dfrac{19m}{\frac{2+\sqrt{3}}{2}}}$

Radius of Dodecagon

18) Circumradius of Dodecagon

Open Calculator

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

$$ex \quad 19.31852m = \frac{\sqrt{6} + \sqrt{2}}{2} \cdot 10m$$

19) Circumradius of Dodecagon given Diagonal across Two Sides

Open Calculator

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

$$ex \quad 20m = \frac{20m}{1}$$

20) Circumradius of Dodecagon given Perimeter

Open Calculator

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

$$ex \quad 19.31852m = \frac{\sqrt{6} + \sqrt{2}}{24} \cdot 120m$$

21) Circumradius of Dodecagon given Width

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

Open Calculator

ex $19.15261m = \dfrac{\sqrt{6} + \sqrt{2}}{2} \cdot \dfrac{37m}{2 + \sqrt{3}}$

22) Inradius of Dodecagon

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

Open Calculator

ex $18.66025m = \dfrac{2 + \sqrt{3}}{2} \cdot 10m$

23) Inradius of Dodecagon given Height

fx $r_i = \dfrac{h}{2}$

Open Calculator

ex $18.5m = \dfrac{37m}{2}$

24) Inradius of Dodecagon given Perimeter

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

Open Calculator

ex $18.66025m = \dfrac{2 + \sqrt{3}}{24} \cdot 120m$

25) Inradius of Dodecagon given Width 🔗

fx $r_i = \dfrac{w}{2}$

ex $18.5m = \dfrac{37m}{2}$

Side of Dodecagon 🔗

26) Side of Dodecagon given Area 🔗

fx $S = \sqrt{\dfrac{A}{3 \cdot \left(2 + \sqrt{3}\right)}}$

Open Calculator 🔗

ex $10.00172m = \sqrt{\dfrac{1120m^2}{3 \cdot \left(2 + \sqrt{3}\right)}}$

27) Side of Dodecagon given Circumradius 🔗

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

Open Calculator 🔗

ex $10.35276m = \dfrac{20m}{\frac{\sqrt{6}+\sqrt{2}}{2}}$

28) Side of Dodecagon given Height

fx $S = \dfrac{h}{2 + \sqrt{3}}$

Open Calculator

ex $9.91412\text{m} = \dfrac{37\text{m}}{2 + \sqrt{3}}$

29) Side of Dodecagon given Perimeter

fx $S = \dfrac{P}{12}$

Open Calculator

ex $10\text{m} = \dfrac{120\text{m}}{12}$

Width of Dodecagon

30) Width of Dodecagon

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

Open Calculator

ex $37.32051\text{m} = \left(2 + \sqrt{3}\right) \cdot 10\text{m}$

31) Width of Dodecagon given Area 🔗

Open Calculator 🔗

$$fx \quad w = \sqrt{\frac{\left(2 + \sqrt{3}\right) \cdot A}{3}}$$

$$ex \quad 37.32692m = \sqrt{\frac{\left(2 + \sqrt{3}\right) \cdot 1120m^2}{3}}$$

32) Width of Dodecagon given Inradius 🔗

Open Calculator 🔗

$$fx \quad w = 2 \cdot r_i$$

$$ex \quad 38m = 2 \cdot 19m$$

Variables Used

- **A** Area of Dodecagon *(Square Meter)*
- **d_2** Diagonal Across Two Sides of Dodecagon *(Meter)*
- **d_3** Diagonal Across Three Sides of Dodecagon *(Meter)*
- **d_4** Diagonal Across Four Sides of Dodecagon *(Meter)*
- **d_5** Diagonal Across Five Sides of Dodecagon *(Meter)*
- **d_6** 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

- Function: **sqrt**, sqrt(Number)
  Square root function
- Measurement: **Length** in Meter (m)
  Length Unit Conversion ⬀
- Measurement: **Area** in Square Meter (m²)
  Area Unit Conversion ⬀

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- **Regular Polygon Formulas** 🗗
- **Reuleaux Triangle Formulas** 🗗
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- **Right Trapezoid Formulas** 🗗
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