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N-gon Formulas

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List of 13 N-gon Formulas

N-gon

1) Number of M sided Polygons formed by joining Vertices of N-gon

Open Calculator

fx $$\mathrm{N_{Polygons}} = C(\mathrm{N_{Sides}}, \mathrm{M_{Sides}})$$

ex $$28 = C(8, 6)$$

Angles of N-gon

2) Central Angle of N-gon

Open Calculator

fx $$\angle_{\mathrm{Central}} = \frac{2 \cdot \pi}{\mathrm{N_{Sides}}}$$

ex $$45^\circ = \frac{2 \cdot \pi}{8}$$

3) Exterior Angle of N-gon

Open Calculator

fx $$\angle_{\mathrm{Exterior}} = \frac{2 \cdot \pi}{\mathrm{N_{Sides}}}$$

ex $$45^\circ = \frac{2 \cdot \pi}{8}$$

4) Sum of Exterior Angles of N-gon

Open Calculator

fx $$\text{Sum}_{\text{Exterior Angles}} = 2 \cdot \pi \cdot \left(\frac{\text{N}_{\text{Sides}}}{\text{N}_{\text{Sides}}} \right)$$

ex $$360^\circ = 2 \cdot \pi \cdot \left(\frac{8}{8} \right)$$

5) Sum of Interior Angles of N-gon

Open Calculator

fx $$\text{Sum}_{\text{Interior Angles}} = (\text{N}_{\text{Sides}} - 2) \cdot \pi$$

ex $$1080^\circ = (8 - 2) \cdot \pi$$

Area and Perimeter of N-gon

6) Area of N-gon

Open Calculator

fx $$\text{A} = \frac{\text{N}_{\text{Sides}} \cdot \text{l}_\text{e}^2}{4 \cdot \tan\left(\frac{\pi}{\text{N}_{\text{Sides}}} \right)}$$

ex $$482.8427\text{m}^2 = \frac{8 \cdot (10\text{m})^2}{4 \cdot \tan\left(\frac{\pi}{8} \right)}$$

7) Perimeter of N-gon

Open Calculator

fx $$\text{P} = \text{l}_\text{e} \cdot \text{N}_{\text{Sides}}$$

ex $$80\text{m} = 10\text{m} \cdot 8$$

Diagonals of N-gon

8) Diagonal across M sides of N-gon

Open Calculator

fx $$d_m = \frac{l_e \cdot \sin\left(\pi \cdot \frac{M_{Sides}}{N_{Sides}}\right)}{\sin\left(\frac{\pi}{N_{Sides}}\right)}$$

ex $$18.47759\text{m} = \frac{10\text{m} \cdot \sin\left(\pi \cdot \frac{6}{8}\right)}{\sin\left(\frac{\pi}{8}\right)}$$

9) Number of Diagonals of N-gon

Open Calculator

fx $$N_{Diagonals} = \frac{N_{Sides} \cdot (N_{Sides} - 3)}{2}$$

ex $$20 = \frac{8 \cdot (8 - 3)}{2}$$

Height of N-gon

10) Height of N-gon when N is Even

Open Calculator

fx $$h = 2 \cdot r_i$$

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

11) Height of N-gon when N is Odd

Open Calculator

fx $$h = \frac{l_e}{2 \cdot \tan\left(\frac{\pi}{2}/N_{Sides}\right)}$$

ex $$25.1367\text{m} = \frac{10\text{m}}{2 \cdot \tan\left(\frac{\pi}{2}/8\right)}$$

Radius of N-gon

12) Circumradius of N-gon

Open Calculator

fx $$r_c = \frac{l_e}{2 \cdot \sin\left(\frac{\pi}{N_{Sides}}\right)}$$

ex $$13.06563\text{m} = \frac{10\text{m}}{2 \cdot \sin\left(\frac{\pi}{8}\right)}$$

13) Inradius of N-gon

Open Calculator

fx $$r_i = \frac{l_e}{2 \cdot \tan\left(\frac{\pi}{N_{Sides}}\right)}$$

ex $$12.07107\text{m} = \frac{10\text{m}}{2 \cdot \tan\left(\frac{\pi}{8}\right)}$$

Variables Used

- $\angle_{Central}$ Central Angle of N-gon *(Degree)*
- $\angle_{Exterior}$ Exterior Angle of N-gon *(Degree)*
- A Area of N-gon *(Square Meter)*
- d_m Diagonal across M Sides of N-gon *(Meter)*
- h Height of N-gon *(Meter)*
- l_e Edge Length of N-gon *(Meter)*
- M_{Sides} M Number of Sides of N-gon
- $N_{Diagonals}$ Number of Diagonals of N-gon
- $N_{Polygons}$ Number of Polygons of N-gon
- N_{Sides} Number of Sides of N-gon
- P Perimeter of N-gon *(Meter)*
- r_c Circumradius of N-gon *(Meter)*
- r_i Inradius of N-gon *(Meter)*
- $Sum_{Exterior\ Angles}$ Sum of Exterior Angles of N-gon *(Degree)*
- $Sum_{Interior\ Angles}$ Sum of Interior Angles of N-gon *(Degree)*

Constants, Functions, Measurements used

- Constant: **pi**, 3.14159265358979323846264338327950288
  Archimedes' constant
- Function: **C**, C(n,k)
  Binomial coefficient function
- Function: **sin**, sin(Angle)
  Trigonometric sine function
- Function: **tan**, tan(Angle)
  Trigonometric tangent function
- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Area** in Square Meter (m²)
  Area Unit Conversion
- Measurement: **Angle** in Degree (°)
  Angle 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 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
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- Rhombus Formulas

- Right Trapezoid Formulas
- Round Corner Formulas
- Salinon Formulas
- Semicircle Formulas
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- Square Formulas
- Star of Lakshmi Formulas
- T Shape Formulas
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- X Shape Formulas

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