Important Formulas of Pentagram PDF

Formulas
Examples
with Units

List of 23
Important Formulas of Pentagram

1) Area of Pentagram Formulas

1.1) Area of Pentagram Formula

Evaluate Formula

Formula

$$A = \sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)} \cdot \frac{l_{e(Pentagon)}^2}{2}$$

Example with Units

$$81.2299\,\text{m}^2 = \sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)} \cdot \frac{10\,\text{m}^2}{2}$$

1.2) Area of Pentagram given Chord Length Formula

Evaluate Formula

Formula

$$A = \frac{\sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)}}{2} \cdot \left(\frac{l_c}{[phi]}\right)^2$$

Example with Units

$$79.4293\,\text{m}^2 = \frac{\sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)}}{2} \cdot \left(\frac{16\,\text{m}}{1.618}\right)^2$$

1.3) Area of Pentagram given Long Chord Slice Formula

Evaluate Formula

Formula

$$A = \frac{\sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)}}{2} \cdot \left(l_{\text{Long Chord Slice}} \cdot [phi]\right)^2$$

Example with Units

$$76.5586\,\text{m}^2 = \frac{\sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)}}{2} \cdot \left(6\,\text{m} \cdot 1.618\right)^2$$

2) Chord Slice of Pentagram Formulas

2.1) Long Chord Slice of Pentagram Formula

Evaluate Formula

Formula

$$l_{\text{Long Chord Slice}} = \frac{l_{e(Pentagon)}}{[phi]}$$

Example with Units

$$6.1803\,\text{m} = \frac{10\,\text{m}}{1.618}$$

2.2) Long Chord Slice of Pentagram given Area Formula

Evaluate Formula

Formula

$$l_{\text{Long Chord Slice}} = \frac{1}{[phi]} \cdot \sqrt{\frac{2 \cdot A}{\sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)}}}$$

Example with Units

$$6.1334\,\text{m} = \frac{1}{1.618} \cdot \sqrt{\frac{2 \cdot 80\,\text{m}^2}{\sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)}}}$$

2.3) Long Chord Slice of Pentagram given Chord Length Formula

Evaluate Formula

Formula

$$l_{\text{Long Chord Slice}} = l_c - l_{e(\text{Pentagon})}$$

Example with Units

$$6\,\text{m} = 16\,\text{m} - 10\,\text{m}$$

2.4) Long Chord Slice of Pentagram given Perimeter Formula

Evaluate Formula

Formula

$$l_{\text{Long Chord Slice}} = \frac{P}{10}$$

Example with Units

$$6\,\text{m} = \frac{60\,\text{m}}{10}$$

2.5) Short Chord Slice of Pentagram Formula

Evaluate Formula

Formula

$$l_{\text{Short Chord Slice}} = \frac{l_{e(\text{Pentagon})}}{[phi]^2}$$

Example with Units

$$3.8197\,\text{m} = \frac{10\,\text{m}}{1.618^2}$$

2.6) Short Chord Slice of Pentagram given Area Formula

Evaluate Formula

Formula

$$l_{\text{Short Chord Slice}} = \sqrt{\frac{2 \cdot A}{\sqrt{5 \cdot \left(5 - 2 \cdot \sqrt{5}\right)}}} \cdot \frac{1}{[phi]^2}$$

Example with Units

$$3.7906\,\text{m} = \sqrt{\frac{2 \cdot 80\,\text{m}^2}{\sqrt{5 \cdot \left(5 - 2 \cdot \sqrt{5}\right)}}} \cdot \frac{1}{1.618^2}$$

2.7) Short Chord Slice of Pentagram given Chord Length Formula

Evaluate Formula

Formula

$$l_{\text{Short Chord Slice}} = \frac{l_c}{[phi]^3}$$

Example with Units

$$3.7771\,\text{m} = \frac{16\,\text{m}}{1.618^3}$$

2.8) Short Chord Slice of Pentagram given Perimeter Formula

Evaluate Formula

Formula

$$l_{\text{Short Chord Slice}} = \frac{P}{10 \cdot [phi]}$$

Example with Units

$$3.7082\,\text{m} = \frac{60\,\text{m}}{10 \cdot 1.618}$$

3) Edges of Pentagram Formulas

3.1) Chord Length of Pentagram Formula

Evaluate Formula

Formula

$$l_c = [phi] \cdot l_{e(\text{Pentagon})}$$

Example with Units

$$16.1803\,\text{m} = 1.618 \cdot 10\,\text{m}$$

3.2) Chord Length of Pentagram given Area Formula

Evaluate Formula

Formula

$$l_c = \frac{[phi] + 1}{[phi]} \cdot \sqrt{\frac{2 \cdot A}{\sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)}}}$$

Example with Units

$$16.0574\,\text{m} = \frac{1.618 + 1}{1.618} \cdot \sqrt{\frac{2 \cdot 80\,\text{m}^2}{\sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)}}}$$

3.3) Chord Length of Pentagram given Long Chord Slice Formula

Evaluate Formula

Formula

$$l_c = l_{e(\text{Pentagon})} + l_{\text{Long Chord Slice}}$$

Example with Units

$$16\,\text{m} = 10\,\text{m} + 6\,\text{m}$$

3.4) Chord Length of Pentagram given Long Chord Slice and Short Chord Slice Formula

Evaluate Formula

Formula

$$l_c = \left(2 \cdot l_{\text{Long Chord Slice}}\right) + l_{\text{Short Chord Slice}}$$

Example with Units

$$16\,\text{m} = \left(2 \cdot 6\,\text{m}\right) + 4\,\text{m}$$

3.5) Chord Length of Pentagram given Perimeter Formula

Evaluate Formula

Formula

$$l_c = \frac{P}{10} \cdot \left(1 + [phi]\right)$$

Example with Units

$$15.7082\,\text{m} = \frac{60\,\text{m}}{10} \cdot \left(1 + 1.618\right)$$

3.6) Pentagonal Edge Length of Pentagram Formula

Evaluate Formula

Formula

$$l_{e(\text{Pentagon})} = l_{\text{Long Chord Slice}} + l_{\text{Short Chord Slice}}$$

Example with Units

$$10\,\text{m} = 6\,\text{m} + 4\,\text{m}$$

3.7) Pentagonal Edge Length of Pentagram given Area Formula

Evaluate Formula

Formula

$$l_{e(Pentagon)} = \sqrt{\frac{2 \cdot A}{\sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)}}}$$

Example with Units

$$9.924\,\text{m} = \sqrt{\frac{2 \cdot 80\,\text{m}^2}{\sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)}}}$$

3.8) Pentagonal Edge Length of Pentagram given Chord Length Formula

Evaluate Formula

Formula

$$l_{e(Pentagon)} = \frac{l_c}{[phi]}$$

Example with Units

$$9.8885\,\text{m} = \frac{16\,\text{m}}{1.618}$$

3.9) Pentagonal Edge Length of Pentagram given Perimeter Formula

Evaluate Formula

Formula

$$l_{e(Pentagon)} = \frac{P \cdot [phi]}{10}$$

Example with Units

$$9.7082\,\text{m} = \frac{60\,\text{m} \cdot 1.618}{10}$$

4) Perimeter of Pentagram Formulas

4.1) Perimeter of Pentagram Formula

Evaluate Formula

Formula

$$P = 10 \cdot l_{\text{Long Chord Slice}}$$

Example with Units

$$60\,\text{m} = 10 \cdot 6\,\text{m}$$

4.2) Perimeter of Pentagram given Area Formula

Evaluate Formula

Formula

$$P = \frac{10}{[phi]} \cdot \sqrt{\frac{2 \cdot A}{\sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)}}}$$

Example with Units

$$61.3337\,\text{m} = \frac{10}{1.618} \cdot \sqrt{\frac{2 \cdot 80\,\text{m}^2}{\sqrt{5 \cdot \left(5 - \left(2 \cdot \sqrt{5}\right)\right)}}}$$

4.3) Perimeter of Pentagram given Pentagonal Edge Length Formula

Evaluate Formula

Formula

$$P = \frac{10 \cdot l_{e(Pentagon)}}{[phi]}$$

Example with Units

$$61.8034\,\text{m} = \frac{10 \cdot 10\,\text{m}}{1.618}$$

Variables used in list of Important Formulas of Pentagram above

- **A** Area of Pentagram *(Square Meter)*
- l_c Chord Length of Pentagram *(Meter)*
- $l_{e(Pentagon)}$ Pentagonal Edge Length of Pentagram *(Meter)*
- $l_{Long\ Chord\ Slice}$ Long Chord Slice of Pentagram *(Meter)*
- $l_{Short\ Chord\ Slice}$ Short Chord Slice of Pentagram *(Meter)*
- **P** Perimeter of Pentagram *(Meter)*

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

- constant(s): **[phi]**, 1.61803398874989484820458683436563811 *Golden ratio*
- 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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