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Astroid Formulas

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List of 20 Astroid Formulas

Astroid

Area of Astroid

1) Area of Astroid

Open Calculator

fx $$A = \frac{3}{8} \cdot \pi \cdot r_{\text{Fixed Circle}}^2$$

ex $$75.39822\text{m}^2 = \frac{3}{8} \cdot \pi \cdot (8\text{m})^2$$

2) Area of Astroid given Chord Length

Open Calculator

fx $$A = \frac{3}{8} \cdot \pi \cdot \left(\frac{l_c}{2 \cdot \sin\left(\frac{\pi}{4}\right)} \right)^2$$

ex $$71.27488\text{m}^2 = \frac{3}{8} \cdot \pi \cdot \left(\frac{11\text{m}}{2 \cdot \sin\left(\frac{\pi}{4}\right)} \right)^2$$

3) Area of Astroid given Perimeter

Open Calculator

fx $$A = \frac{3}{8} \cdot \pi \cdot \left(\frac{P}{6}\right)^2$$

ex $$81.81231\text{m}^2 = \frac{3}{8} \cdot \pi \cdot \left(\frac{50\text{m}}{6}\right)^2$$

4) Area of Astroid given Radius of Rolling Circle

Open Calculator

fx $$A = \frac{3}{8} \cdot \pi \cdot \left(4 \cdot r_{\text{Rolling circle}}\right)^2$$

ex $$75.39822\text{m}^2 = \frac{3}{8} \cdot \pi \cdot (4 \cdot 2\text{m})^2$$

Chord Length of Astroid

5) Chord Length of Astroid

Open Calculator

fx $$l_c = 2 \cdot r_{\text{Fixed Circle}} \cdot \sin\left(\frac{\pi}{4}\right)$$

ex $$11.31371\text{m} = 2 \cdot 8\text{m} \cdot \sin\left(\frac{\pi}{4}\right)$$

6) Chord Length of Astroid given Area

Open Calculator

fx $$l_c = 2 \cdot \sqrt{\frac{8 \cdot A}{3 \cdot \pi}} \cdot \sin\left(\frac{\pi}{4}\right)$$

ex $$11.28379\text{m} = 2 \cdot \sqrt{\frac{8 \cdot 75\text{m}^2}{3 \cdot \pi}} \cdot \sin\left(\frac{\pi}{4}\right)$$

7) Chord Length of Astroid given Perimeter

Open Calculator

fx $$l_c = \frac{P}{3} \cdot \sin\left(\frac{\pi}{4}\right)$$

ex $$11.78511\text{m} = \frac{50\text{m}}{3} \cdot \sin\left(\frac{\pi}{4}\right)$$

8) Chord Length of Astroid given Radius of Rolling Circle

Open Calculator

fx $$l_c = 8 \cdot r_{\text{Rolling circle}} \cdot \sin\left(\frac{\pi}{4}\right)$$

ex $$11.31371\text{m} = 8 \cdot 2\text{m} \cdot \sin\left(\frac{\pi}{4}\right)$$

Perimeter of Astroid

9) Perimeter of Astroid

Open Calculator

fx $$P = 6 \cdot r_{\text{Fixed Circle}}$$

ex $$48\text{m} = 6 \cdot 8\text{m}$$

10) Perimeter of Astroid given Area

Open Calculator

fx $$P = 6 \cdot \sqrt{\frac{8 \cdot A}{3 \cdot \pi}}$$

ex $$47.87307\text{m} = 6 \cdot \sqrt{\frac{8 \cdot 75\text{m}^2}{3 \cdot \pi}}$$

11) Perimeter of Astroid given Chord Length

Open Calculator

fx $$P = 6 \cdot \left(\frac{l_c}{2 \cdot \sin\left(\frac{\pi}{4}\right)} \right)$$

ex $$46.66905\text{m} = 6 \cdot \left(\frac{11\text{m}}{2 \cdot \sin\left(\frac{\pi}{4}\right)} \right)$$

12) Perimeter of Astroid given Radius of Rolling Circle

Open Calculator

fx $$P = 24 \cdot r_{\text{Rolling circle}}$$

ex $$48\text{m} = 24 \cdot 2\text{m}$$

Radius of Fixed Circle of Astroid

13) Radius of Fixed Circle of Astroid

Open Calculator

fx $$r_{\text{Fixed Circle}} = 4 \cdot r_{\text{Rolling circle}}$$

ex $$8\text{m} = 4 \cdot 2\text{m}$$

14) Radius of Fixed Circle of Astroid given Area

Open Calculator

fx $$r_{\text{Fixed Circle}} = \sqrt{\frac{8 \cdot A}{3 \cdot \pi}}$$

ex $$7.978846\text{m} = \sqrt{\frac{8 \cdot 75\text{m}^2}{3 \cdot \pi}}$$

15) Radius of Fixed Circle of Astroid given Chord Length

Open Calculator

fx $$r_{\text{Fixed Circle}} = \frac{l_c}{2 \cdot \sin\left(\frac{\pi}{4}\right)}$$

ex $$7.778175\text{m} = \frac{11\text{m}}{2 \cdot \sin\left(\frac{\pi}{4}\right)}$$

16) Radius of Fixed Circle of Astroid given Perimeter

Open Calculator

fx $$r_{\text{Fixed Circle}} = \frac{P}{6}$$

ex $$8.333333\text{m} = \frac{50\text{m}}{6}$$

Radius of Rolling circle of Astroid

17) Radius of Rolling Circle of Astroid

Open Calculator

fx $$r_{\text{Rolling circle}} = \frac{r_{\text{Fixed Circle}}}{4}$$

ex $$2\text{m} = \frac{8\text{m}}{4}$$

18) Radius of Rolling Circle of Astroid given Area

Open Calculator

fx $$r_{\text{Rolling circle}} = \frac{1}{4} \cdot \sqrt{\frac{8 \cdot A}{3 \cdot \pi}}$$

ex $$1.994711\text{m} = \frac{1}{4} \cdot \sqrt{\frac{8 \cdot 75\text{m}^2}{3 \cdot \pi}}$$

19) Radius of Rolling Circle of Astroid given Chord Length

Open Calculator

fx $$r_{\text{Rolling circle}} = \frac{1}{4} \cdot \frac{l_c}{2 \cdot \sin\left(\frac{\pi}{4}\right)}$$

ex $$1.944544\text{m} = \frac{1}{4} \cdot \frac{11\text{m}}{2 \cdot \sin\left(\frac{\pi}{4}\right)}$$

20) Radius of Rolling Circle of Astroid given Perimeter

Open Calculator

fx $$r_{\text{Rolling circle}} = \frac{P}{24}$$

ex $$2.083333\text{m} = \frac{50\text{m}}{24}$$

Variables Used

- **A** Area of Astroid *(Square Meter)*
- l_c Chord Length of Astroid *(Meter)*
- **P** Perimeter of Astroid *(Meter)*
- $r_{Fixed\ Circle}$ Radius of Fixed Circle of Astroid *(Meter)*
- $r_{Rolling\ circle}$ Radius of Rolling Circle of Astroid *(Meter)*

Constants, Functions, Measurements used

- Constant: **pi**, 3.14159265358979323846264338327950288
  Archimedes' constant
- Function: **sin**, sin(Angle)
  Trigonometric sine function
- Function: **sqrt**, sqrt(Number)
  Square root function
- Measurement: **Length** in Meter (m)
  Length Unit Conversion
- Measurement: **Area** in Square Meter (m²)
  Area 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 Quadrilateral 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
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- Koch Curve Formulas
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- Nonagon Formulas
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- Parallelogram Formulas
- Pentagon Formulas
- Pentagram Formulas
- Polygram Formulas
- Quadrilateral Formulas
- Quarter Circle Formulas
- Rectangle Formulas

- Rectangular Hexagon Formulas
- Regular Polygon Formulas
- Reuleaux Triangle Formulas
- Rhombus Formulas
- Right Trapezoid Formulas
- Round Corner Formulas
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- Square Formulas
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- Trapezoid Formulas
- Tricorn Formulas
- Tri-equilateral Trapezoid Formulas
- Truncated Square Formulas
- Unicursal Hexagram Formulas
- X Shape Formulas

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