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Important Formulas of Ellipse

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List of 24 Important Formulas of Ellipse

Important Formulas of Ellipse

Area of Ellipse

1) Area of Ellipse

$$fx \quad A = \pi \cdot a \cdot b$$

Open Calculator 

$$ex \quad 188.4956m^2 = \pi \cdot 10m \cdot 6m$$

2) Area of Ellipse given Linear Eccentricity and Semi Major Axis

$$fx \quad A = \pi \cdot a \cdot \sqrt{a^2 - c^2}$$

Open Calculator 

$$ex \quad 188.4956m^2 = \pi \cdot (10m) \cdot \sqrt{(10m)^2 - (8m)^2}$$

3) Area of Ellipse given Major and Minor Axes

$$fx \quad A = \left(\frac{\pi}{4}\right) \cdot 2a \cdot 2b$$

Open Calculator 

$$ex \quad 188.4956m^2 = \left(\frac{\pi}{4}\right) \cdot 20m \cdot 12m$$



Eccentricity and Linear Eccentricity of Ellipse

4) Eccentricity of Ellipse

$$\text{fx } e = \sqrt{1 - \left(\frac{b}{a}\right)^2}$$

[Open Calculator !\[\]\(a03a7eb2f4046e1d3c76772003e549ea_img.jpg\)](#)

$$\text{ex } 0.8m = \sqrt{1 - \left(\frac{6m}{10m}\right)^2}$$

5) Eccentricity of Ellipse given Linear Eccentricity and Semi Major Axis

$$\text{fx } e = \frac{c}{a}$$

[Open Calculator !\[\]\(5361750c22c4e047a52f4eac1ec2d4cc_img.jpg\)](#)

$$\text{ex } 0.8m = \frac{8m}{10m}$$

6) Eccentricity of Ellipse given Linear Eccentricity and Semi Minor Axis

$$\text{fx } e = \frac{c}{\sqrt{b^2 + c^2}}$$

[Open Calculator !\[\]\(b792654f2cef9719eabeb6c5be00811e_img.jpg\)](#)

$$\text{ex } 0.8m = \frac{8m}{\sqrt{(6m)^2 + (8m)^2}}$$



7) Linear Eccentricity of Ellipse

$$\text{fx } c = \sqrt{a^2 - b^2}$$

[Open Calculator !\[\]\(e78f798d4ea5c530c9db49e7d26e6b95_img.jpg\)](#)

$$\text{ex } 8\text{m} = \sqrt{(10\text{m})^2 - (6\text{m})^2}$$

Latus Rectum of Ellipse

8) Latus Rectum of Ellipse

$$\text{fx } 2l = 2 \cdot \frac{b^2}{a}$$

[Open Calculator !\[\]\(aa53ad6fea213b8b2226d3077e30533a_img.jpg\)](#)

$$\text{ex } 7.2\text{m} = 2 \cdot \frac{(6\text{m})^2}{10\text{m}}$$

9) Latus Rectum of Ellipse given Eccentricity and Semi Minor Axis

$$\text{fx } 2l = 2 \cdot b \cdot \sqrt{1 - e^2}$$

[Open Calculator !\[\]\(626ce8ac21792b9405bfddfea8e0c96a_img.jpg\)](#)

$$\text{ex } 7.2\text{m} = 2 \cdot 6\text{m} \cdot \sqrt{1 - (0.8\text{m})^2}$$



10) Latus Rectum of Ellipse given Linear Eccentricity and Semi Minor Axis



$$\text{fx } 2l = 2 \cdot \frac{b^2}{\sqrt{c^2 + b^2}}$$

Open Calculator

$$\text{ex } 7.2\text{m} = 2 \cdot \frac{(6\text{m})^2}{\sqrt{(8\text{m})^2 + (6\text{m})^2}}$$

11) Latus Rectum of Ellipse given Major and Minor Axes

$$\text{fx } 2l = \frac{(2b)^2}{2a}$$

Open Calculator

$$\text{ex } 7.2\text{m} = \frac{(12\text{m})^2}{20\text{m}}$$

12) Semi Latus Rectum of Ellipse

$$\text{fx } l = \frac{b^2}{a}$$

Open Calculator

$$\text{ex } 3.6\text{m} = \frac{(6\text{m})^2}{10\text{m}}$$



Major Axis of Ellipse

13) Major Axis of Ellipse

$$\text{fx } 2a = 2 \cdot a$$

[Open Calculator !\[\]\(950a62bbddad88d64435fd35607dfc42_img.jpg\)](#)

$$\text{ex } 20\text{m} = 2 \cdot 10\text{m}$$

14) Semi Major Axis of Ellipse given Eccentricity and Linear Eccentricity

$$\text{fx } a = \frac{c}{e}$$

[Open Calculator !\[\]\(73002692dd5e7a64e60946be3158e719_img.jpg\)](#)

$$\text{ex } 10\text{m} = \frac{8\text{m}}{0.8\text{m}}$$

15) Semi Major Axis of Ellipse given Eccentricity and Semi Minor Axis

$$\text{fx } a = \frac{b}{\sqrt{1 - e^2}}$$

[Open Calculator !\[\]\(104fbf564e2e5a8fbd84f31656d114c7_img.jpg\)](#)

$$\text{ex } 10\text{m} = \frac{6\text{m}}{\sqrt{1 - (0.8\text{m})^2}}$$



16) Semi Major Axis of Ellipse given Linear Eccentricity and Semi Minor Axis

$$\text{fx } a = \sqrt{b^2 + c^2}$$

[Open Calculator !\[\]\(9dfdaff1d86ba3c1f8353b4d1b61b8c5_img.jpg\)](#)

$$\text{ex } 10\text{m} = \sqrt{(6\text{m})^2 + (8\text{m})^2}$$

Minor Axis of Ellipse

17) Minor Axis of Ellipse

$$\text{fx } 2b = 2 \cdot b$$

[Open Calculator !\[\]\(3cb60d42b10e53f9522bb0b392c1c4cd_img.jpg\)](#)

$$\text{ex } 12\text{m} = 2 \cdot 6\text{m}$$

18) Semi Minor Axis of Ellipse given Eccentricity and Linear Eccentricity

$$\text{fx } b = \frac{c \cdot \sqrt{1 - e^2}}{e}$$

[Open Calculator !\[\]\(0d7ca0919e6c47bbd874bfa0189fe22e_img.jpg\)](#)

$$\text{ex } 6\text{m} = \frac{8\text{m} \cdot \sqrt{1 - (0.8\text{m})^2}}{0.8\text{m}}$$

19) Semi Minor Axis of Ellipse given Eccentricity and Semi Major Axis

$$\text{fx } b = a \cdot \sqrt{1 - e^2}$$

[Open Calculator !\[\]\(683dba75afe26e28cd4de5730b776760_img.jpg\)](#)

$$\text{ex } 6\text{m} = 10\text{m} \cdot \sqrt{1 - (0.8\text{m})^2}$$



20) Semi Minor Axis of Ellipse given Linear Eccentricity and Semi Major Axis

$$fx \quad b = \sqrt{a^2 - c^2}$$

[Open Calculator !\[\]\(6605b201d6f14d9b3bcb8ab5f274d107_img.jpg\)](#)

$$ex \quad 6m = \sqrt{(10m)^2 - (8m)^2}$$

Other Formulas of Ellipse

21) Flattening of Ellipse

$$fx \quad f = \frac{2a - 2b}{2b}$$

[Open Calculator !\[\]\(f95dab70c751fda7d824b8b03650f7aa_img.jpg\)](#)

$$ex \quad 0.666667m = \frac{20m - 12m}{12m}$$

22) Focal Parameter of Ellipse

$$fx \quad p = \frac{b^2}{c}$$

[Open Calculator !\[\]\(e9474ce1d70442456f8fe9c393ea149c_img.jpg\)](#)

$$ex \quad 4.5m = \frac{(6m)^2}{8m}$$



Radius of Ellipse

23) Circumradius of Ellipse

$$\text{fx } r_c = \frac{2a}{2}$$

[Open Calculator !\[\]\(d66ff64371a51729ac8c1cdaa685ba6f_img.jpg\)](#)

$$\text{ex } 10\text{m} = \frac{20\text{m}}{2}$$

24) Inradius of Ellipse

$$\text{fx } r_i = \frac{2b}{2}$$

[Open Calculator !\[\]\(faf942dc3e59ce8eb64b4ac481eca7e0_img.jpg\)](#)

$$\text{ex } 6\text{m} = \frac{12\text{m}}{2}$$





Variables Used

- **2a** Major Axis of Ellipse (Meter)
- **2b** Minor Axis of Ellipse (Meter)
- **2l** Latus Rectum of Ellipse (Meter)
- **a** Semi Major Axis of Ellipse (Meter)
- **A** Area of Ellipse (Square Meter)
- **b** Semi Minor Axis of Ellipse (Meter)
- **c** Linear Eccentricity of Ellipse (Meter)
- **e** Eccentricity of Ellipse (Meter)
- **f** Flattening of Ellipse (Meter)
- **l** Semi Latus Rectum of Ellipse (Meter)
- **p** Focal Parameter of Ellipse (Meter)
- **r_c** Circumradius of Ellipse (Meter)
- **r_i** Inradius of Ellipse (Meter)



Constants, Functions, Measurements used

- **Constant:** **pi**, 3.14159265358979323846264338327950288
Archimedes' constant
- **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

- [Ellipse Formulas](#) 
- [Elliptical Ring Formulas](#) 
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