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List of 15 Mirrors Formulas

Mirrors

Concave Mirrors

1) Focal Length of Concave Mirror

$$\text{fx } f_{\text{concave}} = \frac{r_{\text{concave}}}{2}$$

[Open Calculator !\[\]\(de95854c7ee024cfadc48187bbb781b2_img.jpg\)](#)

$$\text{ex } 0.25\text{m} = \frac{0.5\text{m}}{2}$$

2) Focal Length of Concave Mirror with Real Image

$$\text{fx } f_{\text{concave,real}} = \frac{v_{\text{concave,real}} \cdot u_{\text{concave,real}}}{v_{\text{concave,real}} + (u_{\text{concave,real}})}$$

[Open Calculator !\[\]\(6a9b39b98eb945faa14c645ec99e4eaa_img.jpg\)](#)

$$\text{ex } 0.0375 = \frac{0.10\text{m} \cdot 0.06\text{m}}{0.10\text{m} + (0.06\text{m})}$$

3) Focal Length of Concave Mirror with Virtual Image

$$\text{fx } f_{\text{concave,virtual}} = \frac{v_{\text{concave,virtual}} \cdot u_{\text{concave,virtual}}}{u_{\text{concave,virtual}} - v_{\text{concave,virtual}}}$$

[Open Calculator !\[\]\(f1c5da15572e3e09d343161be98f508d_img.jpg\)](#)

$$\text{ex } -0.173333 = \frac{-0.2\text{m} \cdot 1.30\text{m}}{1.30\text{m} - -0.2\text{m}}$$



4) Image Distance of Concave Mirror with Virtual Image

fxOpen Calculator 

$$V_{\text{concave,virtual}} = \frac{f_{\text{concave,virtual}} \cdot u_{\text{concave,virtual}}}{(u_{\text{concave,virtual}}) + f_{\text{concave,virtual}}}$$

ex

$$-0.200001\text{m} = \frac{-0.173334 \cdot 1.30\text{m}}{(1.30\text{m}) + -0.173334}$$

5) Magnification of Concave Mirror with Real Image

fxOpen Calculator 

$$m_{\text{concave,real}} = \frac{V_{\text{concave,real}}}{u_{\text{concave,real}}}$$

ex

$$1.666667 = \frac{0.10\text{m}}{0.06\text{m}}$$

6) Magnification of Concave Mirror with Virtual Image

fxOpen Calculator 

$$m_{\text{concave,virtual}} = \frac{V_{\text{concave,virtual}}}{u_{\text{concave,virtual}}}$$

ex

$$-0.153846 = \frac{-0.2\text{m}}{1.30\text{m}}$$

7) Magnification of Concave Mirror with Virtual Image using Height

fxOpen Calculator 

$$m_{\text{concave}} = \frac{h_{\text{image,concave}}}{h_{\text{object,concave}}}$$

ex

$$2.5 = \frac{0.70\text{m}}{0.28\text{m}}$$



8) Object Distance in Concave Mirror with Real Image

$$\text{fx } u_{\text{concave,real}} = \frac{v_{\text{concave,real}} \cdot (f_{\text{concave,real}})}{v_{\text{concave,real}} - (f_{\text{concave,real}})}$$

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

$$\text{ex } 0.06\text{m} = \frac{0.10\text{m} \cdot (0.0375)}{0.10\text{m} - (0.0375)}$$

9) Object Distance in Concave Mirror with Virtual Image

$$\text{fx } u_{\text{concave,virtual}} = \frac{(f_{\text{concave,virtual}}) \cdot (v_{\text{concave,virtual}})}{(f_{\text{concave,virtual}}) - (v_{\text{concave,virtual}})}$$

[Open Calculator !\[\]\(05be7c7a8995decd503647c99211f7c2_img.jpg\)](#)

$$\text{ex } 1.300038\text{m} = \frac{(-0.173334) \cdot (-0.2\text{m})}{(-0.173334) - (-0.2\text{m})}$$

Convex Mirrors

10) Focal Length of Convex Mirror

$$\text{fx } f_{\text{convex}} = \frac{1}{\left(\frac{1}{u_{\text{convex}}}\right) + \left(\frac{1}{v_{\text{convex}}}\right)}$$

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

$$\text{ex } -2.798801\text{m} = \frac{1}{\left(\frac{1}{0.4667\text{m}}\right) + \left(\frac{1}{-0.4\text{m}}\right)}$$



11) Focal Length of Convex Mirror given Radius

$$\text{fx } f_{\text{convex}} = -\frac{r_{\text{convex}}}{2}$$

[Open Calculator !\[\]\(e2376d476d06eb31946dc01a69a4403a_img.jpg\)](#)

$$\text{ex } -2.798801\text{m} = -\frac{5.597602\text{m}}{2}$$

12) Image Distance of Convex Mirror

$$\text{fx } v_{\text{convex}} = \frac{u_{\text{convex}} \cdot f_{\text{convex}}}{u_{\text{convex}} - (f_{\text{convex}})}$$

[Open Calculator !\[\]\(0b5e7e25e8775f7e7e80906ada4f0021_img.jpg\)](#)

$$\text{ex } -0.4\text{m} = \frac{0.4667\text{m} \cdot -2.798801\text{m}}{0.4667\text{m} - (-2.798801\text{m})}$$

13) Magnification of Convex Mirror

$$\text{fx } m_{\text{convex}} = \frac{v_{\text{convex}}}{u_{\text{convex}}}$$

[Open Calculator !\[\]\(bd3b31712ad9bab5a241210fa6925cdd_img.jpg\)](#)

$$\text{ex } -0.857082 = \frac{-0.4\text{m}}{0.4667\text{m}}$$

14) Magnification of Convex Mirror using Height

$$\text{fx } m_{\text{convex}} = \frac{h_{\text{image,convex}}}{h_{\text{object,convex}}}$$

[Open Calculator !\[\]\(7bc43b319a082987e20f7bf78f4bab80_img.jpg\)](#)

$$\text{ex } -0.857008 = \frac{-0.654\text{m}}{0.76312\text{m}}$$



15) Object Distance in Convex Mirror

[Open Calculator !\[\]\(eafc244b53721dd1ec133f0772f70fc7_img.jpg\)](#)

$$\text{fx } u_{\text{convex}} = \frac{v_{\text{convex}} \cdot f_{\text{convex}}}{v_{\text{convex}} - f_{\text{convex}}}$$

$$\text{ex } 0.4667\text{m} = \frac{-0.4\text{m} \cdot -2.798801\text{m}}{-0.4\text{m} - -2.798801\text{m}}$$



Variables Used

- f_{concave} Focal Length of Concave Mirror (Meter)
- $f_{\text{concave,real}}$ Focal Length of Concave Mirror with Real Image
- $f_{\text{concave,virtual}}$ Focal Length of Concave Mirror with Virtual Image
- f_{convex} Focal Length of Convex Mirror (Meter)
- $h_{\text{image,concave}}$ Image Height in Concave Mirror (Meter)
- $h_{\text{image,convex}}$ Image Height in Convex Mirror (Meter)
- $h_{\text{object,concave}}$ Object Height in Concave Mirror (Meter)
- $h_{\text{object,convex}}$ Object Height in Convex Mirror (Meter)
- m_{concave} Magnification of Concave Mirror
- $m_{\text{concave,real}}$ Magnification of Concave Mirror with Real Image
- $m_{\text{concave,virtual}}$ Magnification of Concave Mirror with Virtual Image
- m_{convex} Magnification of Convex Mirror
- r_{concave} Radius of Concave Mirror (Meter)
- r_{convex} Radius of Convex Mirror (Meter)
- $u_{\text{concave,real}}$ Object Distance in Concave Mirror Real Image (Meter)
- $u_{\text{concave,virtual}}$ Object Distance in Concave Mirror Virtual Image (Meter)
- u_{convex} Object Distance of Convex Mirror (Meter)
- $v_{\text{concave,real}}$ Image Distance of Concave Mirror Real Image (Meter)
- $v_{\text{concave,virtual}}$ Image Distance of Concave Mirror Virtual Image (Meter)
- v_{convex} Image Distance of Convex Mirror (Meter)



Constants, Functions, Measurements used

- **Measurement:** **Length** in Meter (m)

Length Unit Conversion 



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