Important Mirrors Formulas PDF

Formulas
Examples
with Units

List of 15
Important Mirrors Formulas

1) Concave Mirrors Formulas

1.1) Focal Length of Concave Mirror Formula

Evaluate Formula

Formula

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

Example with Units

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

1.2) Focal Length of Concave Mirror with Real Image Formula

Evaluate Formula

Formula

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

Example with Units

$$0.0375 = \frac{0.10\,\text{m} \cdot 0.06\,\text{m}}{0.10\,\text{m} + \left(0.06\,\text{m} \right)}$$

1.3) Focal Length of Concave Mirror with Virtual Image Formula

Evaluate Formula

Formula

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

Example with Units

$$-0.1733 = \frac{-0.2\,\text{m} \cdot 1.30\,\text{m}}{1.30\,\text{m} - -0.2\,\text{m}}$$

1.4) Image Distance of Concave Mirror with Virtual Image Formula

Evaluate Formula

Formula

$$v_{concave,virtual} = \frac{f_{concave,virtual} \cdot u_{concave,virtual}}{\left(u_{concave,virtual} \right) + f_{concave,virtual}}$$

Example with Units

$$-0.2\,\text{m} = \frac{-0.173334 \cdot 1.30\,\text{m}}{\left(1.30\,\text{m} \right) + -0.173334}$$

1.5) Magnification of Concave Mirror with Real Image Formula

Evaluate Formula

Formula

$$m_{concave,real} = \frac{v_{concave,real}}{u_{concave,real}}$$

Example with Units

$$1.6667 = \frac{0.10\,\text{m}}{0.06\,\text{m}}$$

1.6) Magnification of Concave Mirror with Virtual Image Formula

Evaluate Formula

Formula

$$m_{concave,virtual} = \frac{v_{concave,virtual}}{u_{concave,virtual}}$$

Example with Units

$$-0.1538 = \frac{-0.2\,m}{1.30\,m}$$

1.7) Magnification of Concave Mirror with Virtual Image using Height Formula

Evaluate Formula

Formula

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

Example with Units

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

1.8) Object Distance in Concave Mirror with Real Image Formula

Evaluate Formula

Formula

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

Example with Units

$$0.06\,m = \frac{0.10\,m \cdot \left(0.0375 \right)}{0.10\,m - \left(0.0375 \right)}$$

1.9) Object Distance in Concave Mirror with Virtual Image Formula

Evaluate Formula

Formula

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

Example with Units

$$1.3\,m = \frac{\left(-0.173334 \right) \cdot \left(-0.2\,m \right)}{\left(-0.173334 \right) - \left(-0.2\,m \right)}$$

2) Convex Mirrors Formulas

2.1) Focal Length of Convex Mirror Formula

Evaluate Formula

Formula

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

Example with Units

$$-2.7988\,m = \frac{1}{\left(\frac{1}{0.4667\,m} \right) + \left(\frac{1}{-0.4\,m} \right)}$$

2.2) Focal Length of Convex Mirror given Radius Formula

Evaluate Formula

Formula

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

Example with Units

$$-2.7988\,m = -\frac{5.597602\,m}{2}$$

2.3) Image Distance of Convex Mirror Formula

Evaluate Formula

Formula

$$v_{convex} = \frac{u_{convex} \cdot f_{convex}}{u_{convex} - \left(f_{convex} \right)}$$

Example with Units

$$-0.4\,\text{m} = \frac{0.4667\,\text{m} \cdot -2.798801\,\text{m}}{0.4667\,\text{m} - \left(-2.798801\,\text{m} \right)}$$

2.4) Magnification of Convex Mirror Formula

Evaluate Formula

Formula

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

Example with Units

$$-0.8571 = \frac{-0.4\,\text{m}}{0.4667\,\text{m}}$$

2.5) Magnification of Convex Mirror using Height Formula

Evaluate Formula

Formula

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

Example with Units

$$-0.857 = \frac{-0.654\,\text{m}}{0.76312\,\text{m}}$$

2.6) Object Distance in Convex Mirror Formula

Evaluate Formula

Formula

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

Example with Units

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

Variables used in list of Mirrors Formulas above

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

Constants, Functions, Measurements used in list of Mirrors Formulas above

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

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