9.3 Reflective Optics: Mirrors

Make a sketch of what you observe:

<table>
<thead>
<tr>
<th>Angle of Incidence</th>
<th>Angle of Reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>20°</td>
<td></td>
</tr>
<tr>
<td>30°</td>
<td></td>
</tr>
<tr>
<td>45°</td>
<td></td>
</tr>
<tr>
<td>60°</td>
<td></td>
</tr>
<tr>
<td>75°</td>
<td></td>
</tr>
<tr>
<td>90°</td>
<td></td>
</tr>
</tbody>
</table>

What do you conclude about how light is reflected from a mirror? (2 points)

Draw your prediction.
Was your prediction correct?

What happens with the convex mirror? (5 points)

What happens with the concave mirror? (5 points)

Which beam disappears? (5 points)

Where is the focal point? (3 points)

What is the radius of curvature? (1 point)

Is your face larger or smaller? Does a concave mirror magnify or demagnify? Does a convex mirror magnify or demagnify? (1 point)
9.4 Refractive Optics: Lenses

\[ a = \quad \quad \quad \quad \quad \quad (1 \text{ point}) \]

\[ b = \quad \quad \quad \quad \quad \quad (1 \text{ point}) \]

\[ F = \quad \quad \quad \quad \quad \quad (2 \text{ points}) \]

What appears to be happening? \( (4 \text{ points}) \)

Note some similarities between what you have drawn in Fig 9.4 and in Fig 9.5. \( (5 \text{ points}) \)

\[ F = \quad \quad \quad \quad \quad \quad (2 \text{ points}) \]

Making a Telescope

\[ N = \quad \quad \quad \quad \quad \quad (2 \text{ points}) \]

Describe what you see. \( (5 \text{ points}) \)
\[ P = \underline{\text{\hspace{1cm}}} \quad (2 \text{ points}) \]

Describe what you see. \((5 \text{ points})\)

Which is better? What makes it better? Why was Kepler’s version unpopular? \((5 \text{ points})\)

The Magnifying and Light Collecting Power of a Telescope

\[ M_{K} = \underline{\text{\hspace{1cm}}} \quad (1 \text{ point}) \]

\[ f_{\text{eyepiece},G} = \underline{\text{\hspace{1cm}}} \quad (2 \text{ points}) \]

\[ M_{G} = \underline{\text{\hspace{1cm}}} \quad (1 \text{ point}) \]

Compare the magnifications. \((2 \text{ points})\)