

AP Physics 2 Review Questions

Integrating Content, Inquiry, and Reasoning

1. A student wishes to take a picture of himself in a mirror. He is standing four feet in front of the mirror. However, each picture has a blurry image of him. The camera has an automatic focus that detects the closest surface to serve as the focus plane of the picture. Explain to the student what is occurring, why his images are blurry, and a needed change to the camera to obtain clear images.
2. Telescopes can use mirrors or lenses to collect light from distant stellar objects. Which type of mirror would be used in a reflecting telescope: concave or convex? Explain how you made your determination.
3. On the side mirror of an automobile, there is a warning that reads: "Objects in mirror are closer than they appear." A student notices that she looks smaller in the mirror when investigating the claim. She asserts, "The side mirror is concave." Do you agree or disagree with the student's claim? Use evidence from the experiment to support your position in a paragraph-length response.
4. Figure 6 shows an object, arrow W , standing in front of a spherical mirror that can be mounted within the dashed space, M . The mirror extends above and below the central axis. The four arrows, I_1 – I_4 , represent possible images formed by the mirror. The image distance and size are not drawn to scale.

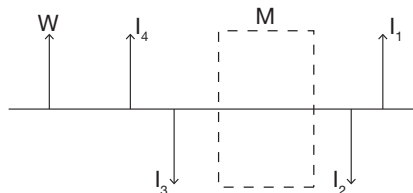


Figure 6.

- a.* Which image(s) could not possibly be formed by either a concave or convex mirror? Cite evidence from the experiment to support your answer.
- b.* Which image(s) would be caused by a convex mirror? Identify the image(s) as real or virtual. Justify your answer.
- c.* Which image(s) would be caused by a concave mirror? Identify the image(s) as real or virtual. Justify your answer.
- d.* One image is shared between the concave and convex mirrors. Based on your answers to parts *b* and *c*, is additional information needed to determine if that image is formed by a concave or convex mirror? Use evidence from the experiment to support your answer.