PHYSICS 11 OPTICS WORKSHEET 1

1. A pinhole camera 20.0 cm long is used to photograph a student 175 cm high. If the image is 10.0 cm high, how far from the camera is the student?

2. If that same camera is used to photograph a 10.0 m high building located 30.0 m away, calculate the height of the image on the film.

3. Phreddy Physics wants to take a picture of his image in a plane mirror. If the camera is 1.2 m in front of the mirror, at what distance should the camera lens be focused? Explain why.

4. Use rays to locate the image of the object behind the mirror for each diagram:
    a) object
        ☆

        ▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨▨ mirror

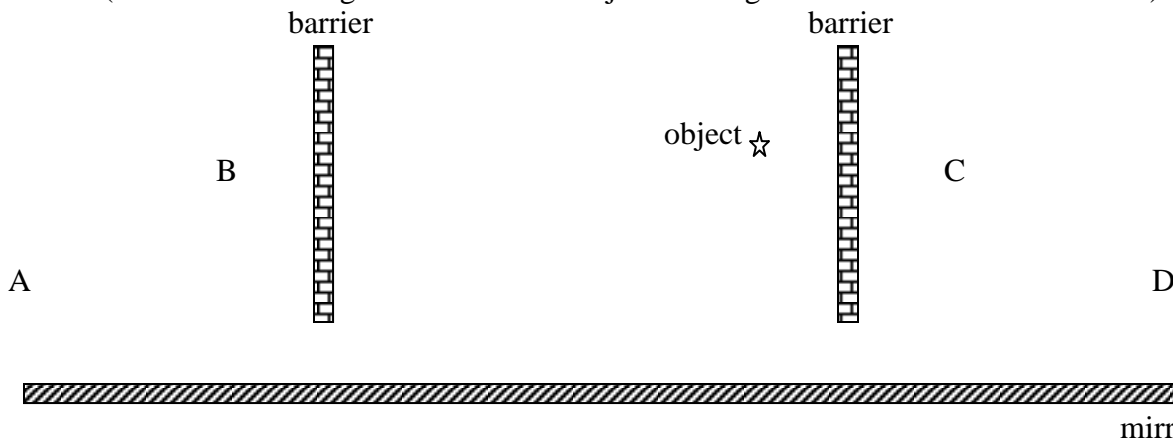   b)   ▮ mirror

        ↗

        (Hint: in this case first locate the arrow tip, then the tail, then connect up)

5. A 1.5 m tall girl stands 2.4 m in front of a vertical hanging mirror. The girl is barely able to see her entire body.
    a) How high must the top of the mirror be for her to see her entire face?
    b) What is the size of the mirror? (Hint: how far down the mirror can she see her feet?)

6. (Bonus) Draw accurate rays to show at which locations (A, B, C or D) the point object would not be seen. (hint: draw the range of view for the objectÕs image on either side of each barrier)

    barrier   barrier

    B   object ☆   C

    A   D

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    mirror

1. 350 cm   2. 6.7 cm   3. 2.4 cm; his image is the same distance behind the mirror as he is in front 4. in both cases, image should be same perpendicular distance behind mirror   5. a) 1.5 m b) 0.75 m   6. image can not be seen at B and D