

35. A concave spherical mirror can be used to project an image onto a sheet of paper, allowing the magnified image of an illuminated real object to be accurately traced. If you have a concave mirror with a focal length of 8.5 cm, where would you place a sheet of paper so that the image projected onto it is twice as far from the mirror as the object is? Is the image upright or inverted, real or virtual? What would the magnification of the image be?

For problem 36, see Sample Problem C.

36. A convex mirror with a radius of curvature of 45.0 cm forms a 1.70 cm tall image of a pencil at a distance of 15.8 cm behind the mirror. Calculate the object distance for the pencil and its height. Is the image real or virtual? What is the magnification? Is the image inverted or upright?

COLOR AND POLARIZATION

Review Questions

37. What are the three primary additive colors? What happens when you mix them?
38. What are the three primary subtractive colors (or primary pigments)? What happens when you mix them?
39. Explain why a polarizing disk used to analyze light can block light from a beam that has been passed through another polarizer. What is the relative orientation of the two polarizing disks?

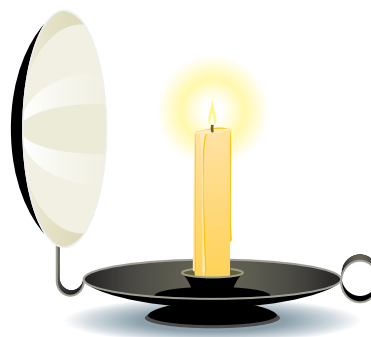
Conceptual Questions

40. Explain what could happen when you mix the following:
- cyan and yellow pigment
 - blue and yellow light
 - pure blue and pure yellow pigment
 - green and red light
 - green and blue light
41. What color would an opaque magenta shirt appear to be under the following colors of light?
- white
 - red
 - cyan
 - green
 - yellow

42. A substance is known to reflect green and blue light. What color would it appear to be when it is illuminated by white light? by blue light?
43. How can you tell if a pair of sunglasses has polarizing lenses?
44. Why would sunglasses with polarizing lenses remove the glare from your view of the hood of your car or a distant body of water but not from a tall metal tank used for storing liquids?
45. Is light from the sky polarized? Why do clouds seen through polarizing glasses stand out in bold contrast to the sky?

MIXED REVIEW

46. The real image of a tree is magnified -0.085 times by a telescope's primary mirror. If the tree's image forms 35 cm in front of the mirror, what is the distance between the mirror and the tree? What is the focal length of the mirror? What is the value for the mirror's radius of curvature? Is the image virtual or real? Is the image inverted or upright?
47. A candlestick holder has a concave reflector behind the candle, as shown below. The reflector magnifies a candle -0.75 times and forms an image 4.6 cm away from the reflector's surface. Is the image inverted or upright? What are the object distance and the reflector's focal length? Is the image virtual or real?



48. A child holds a candy bar 15.5 cm in front of the convex side-view mirror of an automobile. The image height is reduced by one-half. What is the radius of curvature of the mirror?