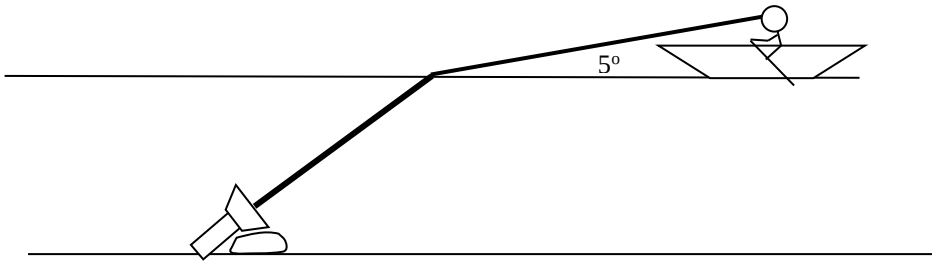
Physics 112

Light Refraction Assignment

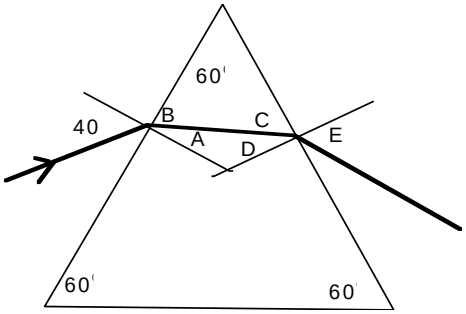
Sketch the path followed by the ray of light and calculate the appropriate angle(s)

Option A

1. Determine the path followed by a ray of light going from water into air, at an incident angle of 32^0.
2. As light goes from an unknown medium into water the angle of incidence was found to be 25^0 and the angle of refraction was found to be 50^0. What is the unknown medium?
3. Determine the path of a ray of light going from air into crown glass and then into water. The angle of incidence in the air was 68^0.
4. Determine the critical angle for light passing from diamond into water.
5. Determine the critical angle of light passing from water into crown glass.
6. Light goes from water at an angle of 45^0 into crown glass and back to water. What is the angle of refraction into the water?
7. Hannah's friend, who shall remain nameless but not blameless, lost her new waterproof LED flashlight when he was out canoeing across a lake. The light is still on at the bottom of the lake and Hannah is on a mission to find it. As she paddles slowly across the lake, she barely sees a light shining out of the water. Obviously, she wouldn't find it if it is laying on the bottom of the lake so based on the diagram determine the angle of the flashlight with the bottom of the lake.



8. A ray of light is incident on an equilateral crown glass triangular prism at an angle of incidence of 40^0. Calculate the path of the light as it enters, passes through and exits the prism.



Option B:

Do this question only. A) Based on question 6 determine how deep the lake is if Hannah is 17.5m away (horizontally) from the flashlight when she sees it. Hannah's eyes are 1.2m above the water level. B) What is the smallest angle that the flashlight can make with the bottom of the lake and still have light coming out of the water?

Practice Problems

9. Calculate the path of a ray of light that goes from crown glass into air when the angle of refraction was 55^0. **(32.61^0)**
10. Determine the path of a ray of light as it goes from air through a flint glass plate and back into air at an incident angle of 40^0. **(22.93^0, 40^0)**
11. Determine the path of a ray of light from air into diamond when the angle of incidence was 60^0. **(20.97^0)**
12. Determine the critical angle for light going from water to air. **(48.61^0)**