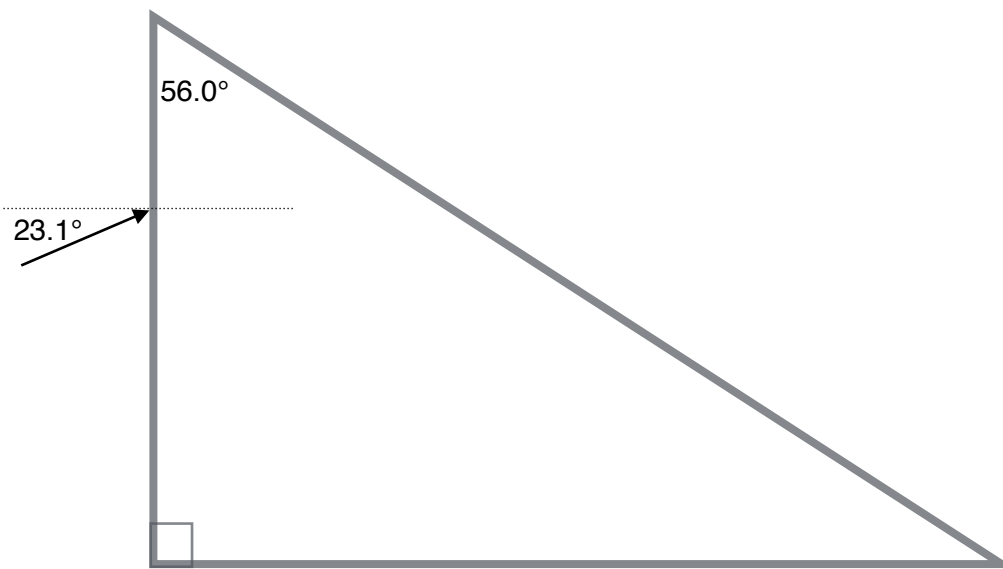


Physics 10164 - Exam 4A

Partial credit will be given provided you show all work and are solving parts of the problem correctly. Points will be deducted if you don't show your work even if you get the right answer. Clearly indicate your answer with a circle or a box and remember to include correct units and significant figures.

1. (25 points) Light is incident on the left edge of a triangular prism as shown below. The prism is surrounded by air and made from a substance with $n = 1.68$. Where does the light exit the prism and with what exit angle of refraction?



2. (25 pts) Two lenses are separated by a distance of 15 cm. The front lens has a focal length of 25 cm, and the back lens has a focal length of -14 cm. The final image formed by the two lenses is located 7.0 cm in front of the front lens (22 cm in front of the back lens). Where is the object for this two-lens system, and what is the overall magnification?

3. (25 pts) Light of wavelength 623 nm is incident upon two slits separated by 0.30 mm. The interference pattern is projected on a wall 9.0 meters away from the slits. At a distance of 5.6 cm away from the center of the pattern, is it bright or dark? Justify your answer mathematically.

4. (25 pts) A normal person has a near point of 25 cm and a far point of infinity. A patient with hyperopia is measured to have a near point of 55 cm and a far point of infinity.

- a) What is the focal length of the lenses necessary in order for this person to have a normal near point?
- b) What is the new far point for this person with these lenses?