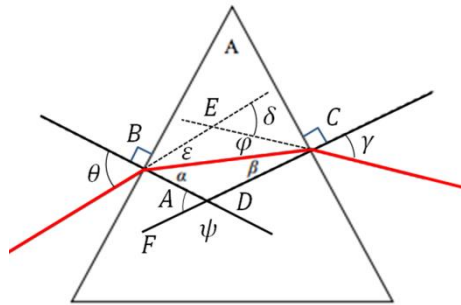


**Answer on Question #83418, Physics / Optics**

**Question.** Determine the angle of deviation of a ray by a glass prism with a prism angle of  $3^\circ$  if the angle of incidence of the ray on the front face of the prism is zero. The refractive index of the glass material is 1.5.

**Solution.**

For prism



The total deviation of the ray is given by

$$\delta = \theta + \gamma - A,$$

Where

$$\sin \gamma = n \cdot \sin \left( A - \arcsin \left( \frac{\sin \theta}{n} \right) \right).$$

In our case

$$\theta = 0^\circ \text{ and } A = 3^\circ \text{ and } n = 1.5.$$

$$\begin{aligned} \sin \gamma &= n \cdot \sin \left( A - \arcsin \left( \frac{\sin \theta}{n} \right) \right) = 1.5 \cdot \sin \left( 3^\circ - \arcsin \left( \frac{\sin 0^\circ}{1.5} \right) \right) = 1.5 \cdot \sin(3^\circ - 0^\circ) = \\ &= 0.0785039 \rightarrow \gamma = 4.5^\circ. \end{aligned}$$

So,

$$\delta = 0^\circ + 4.5^\circ - 3^\circ = 1.5^\circ.$$

**Answer.**  $\delta = 1.5^\circ$ .

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