This problem is relevant to sun dogs: http://en.wikipedia.org/wiki/Sun_dog .

Hint: If θ_2 is the angle of refraction at the first interface on the left, show that

$$\begin{aligned}\delta &= \text{sum of deviations at the two interfaces} \\ &= \arcsin\left(n\sin\theta_2\right) + \arcsin\left(n\sin\left(\phi-\theta_2\right)\right) - \phi\end{aligned}$$

using geometry and Snell's law at each interface. Then use the derivative of the arcsin already used in Problem C 33.66.