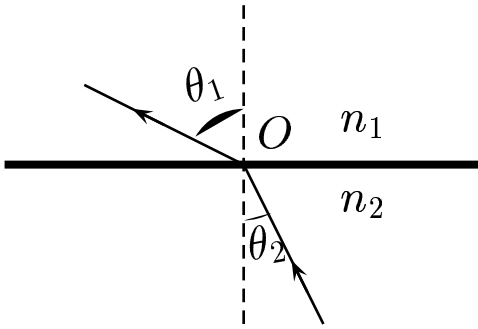


Given: Consider the incidence of a light ray from a denser medium with refraction index n_2 to a lighter medium with refraction index $n_1, n_2 > n_1$. At $\theta_2 = \theta_c$, where θ_c is the critical angle, $\theta_1 = 90^\circ$.



The range of the total reflection angle θ_2 is

- A) $0 < \theta_2 < \theta_c$.
- B) $\theta_c < \theta_2 < 90^\circ$.
- C) $0 < \theta_2 < 90^\circ$.
- D) can't be determined.

The Snell's law says that $n_1 \sin \theta_1 = n_2 \sin \theta_2$. At the critical angle, $\sin \theta_c = \frac{n_1}{n_2} \sin 90^\circ = \frac{n_1}{n_2}$. If $\theta_2 > \theta_c, \sin \theta_1 = \frac{n_2}{n_1} \sin \theta_2 = \frac{\sin \theta_2}{\sin \theta_c}$. So θ_1 cannot be real, i.e. there is no refracted ray in medium 1. Thus in the region $\theta_c < \theta_2 < 90^\circ$ the ray in medium 2 is totally reflected.

Answer **B**.