NAME:- SHREYAS SRINIVASA
BLAZER ID:- SSRINIVA | PH 2211-PS

03/26/2022

INVESTIGATION - 3
LAB

Slope of $\sin(\theta_2)$ vs. $\sin(\theta_1)$ graph:

$$\text{Slope} = \frac{\Delta y}{\Delta x} = \frac{0.45399 - 0.2588}{0.3420 - 0.1736}$$

$$= 1.159$$

$\therefore n_2$ found experimentally is 1.159.

But, index of refraction of water is 1.33

$$\% \text{ difference} = \frac{|1.33 - 1.159|}{\frac{1.33 + 1.8159}{2}} \times 100$$

$$= \frac{0.171 \times 100}{1.2445} = 0.137 \times 100$$

$$= 13.7\% \text{ difference}$$

Experimentally found critical angle = 48.1°

Predicted critical angle using index of refraction provided by textbook = $\theta_{crit.} = \sin^{-1}\left(\frac{n_2}{n_1}\right)$

$$= \sin^{-1}\left(\frac{1.00}{1.33}\right)$$

$= 48.75°$

$$\% \text{ difference} = \frac{|48.75 - 48.1|}{\frac{48.75 + 48.1}{2}} \times 100$$

$$= \frac{0.65}{48.425} \times 100$$

$$= 0.013 \times 100$$

$$= 1.3\% \text{ difference}$$