# 1 | Problem 3

$$n=\frac{c}{v}$$
 
$$1.33=\frac{c}{v}$$
 
$$1.33v=c$$
 
$$v=\frac{1}{1.33}c$$
 
$$v\approx 0.7502c$$
 
$$v\approx 0.7052*299792458 \text{ m/s}$$
 
$$v\approx 211413641.3816 \text{ m/s}$$

## 2 | Problem 4

$$n_1 = n_{
m air} = 1.0003$$
  $n_2 = n_{
m diamond} = 2.42$   $heta_1 = 30^\circ$ 

#### 2.1 | Angle of Refraction

$$\begin{aligned} n_1 \sin \theta_1 &= n_2 \sin \theta_2 \\ \frac{n_1 \sin \theta_1}{n_2} &= \theta_2 \\ \frac{1.0003 \sin 30^\circ}{2.42} &= \theta_2 \\ \frac{1.0003 * 0.5}{2.42} &= \theta_2 \\ 0.2067^\circ &\approx \theta_2 \end{aligned}$$

#### 2.2 | Speed of Light in Medium

$$n_2 = \frac{c}{v}$$
 
$$n_2 v = c$$
 
$$v = \frac{c}{n_2}$$
 
$$v = \frac{c}{2.42}$$
 
$$v \approx \frac{299792458}{2.42} \text{ m/s}$$
 
$$v \approx 123881181 \text{ m/s}$$

## 3 | Problem 5

$$\begin{split} n_1 &= 1.52 \\ n_2 &= 1.33 \\ \theta_2 &= 90^\circ \\ n_1 \sin \theta_1 &= n_2 \sin \theta_2 \\ n_1 &= \frac{n_2 \sin \theta_2}{n_1} \\ n_1 &= \frac{1.52 \sin 90^\circ}{1.33} \\ n_1 &= \frac{1.52}{1.33} \\ n_1 &\approx 1.143^\circ \end{split}$$

## **4 | Problem 7**

**D.** It is said to be *dispersive*.