

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

$$n_1 = n_{\text{air}} = 1.0003$$

$$n_2 = n_{\text{diamond}} = 2.42$$

$$\theta_1 = 30^\circ$$

2.1 | Angle of Refraction

$$n_1 \sin \theta_1 = n_2 \sin \theta_2$$

$$\frac{n_1 \sin \theta_1}{n_2} = \sin \theta_2$$

$$\frac{1.0003 \sin 30^\circ}{2.42} = \sin \theta_2$$

$$\frac{1.0003 * 0.5}{2.42} = \sin \theta_2$$

$$0.2067^\circ \approx \theta_2$$

2.2 | Speed of Light in Medium

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

3 | Problem 5

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

4 | Problem 7

D. It is said to be *dispersive*.