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Ch. 3, 2

Dr. Bob

$$1. \quad v = 2.5 \times 10^8 \text{ m/s}$$

$$c = 3.0 \times 10^8 \text{ m/s}$$

$$n = \frac{c}{v} = \frac{3.00 \times 10^8 \text{ m/s}}{2.5 \times 10^8 \text{ m/s}} = \frac{3.00}{2.5}$$

$$\boxed{n = 1.2}$$

$$2. \quad n = 1.92$$

$$v = ?$$

$$v = \frac{c}{n} = \frac{3.00 \times 10^8 \text{ m/s}}{1.92}$$

$$\boxed{v = 1.56 \times 10^8 \text{ m/s}}$$

$$3. \quad n_{\text{air}} = 1.000$$

$$n_{\text{zircon}} = 1.92$$

$$v_{\text{air}} = c = 3.00 \times 10^8 \text{ m/s}$$

$$v_{\text{zircon}} = 1.56 \times 10^8 \text{ m/s}$$

The decrease $3.00 \times 10^8 \text{ m/s} - 1.56 \times 10^8 \text{ m/s}$

$$\boxed{\Delta v = 1.44 \times 10^8 \text{ m/s}}$$

$$4. \quad n_{\text{glass}} = 1.50$$

$$v = \frac{c}{n} = \frac{3.00 \times 10^8 \text{ m/s}}{1.5}$$

$$\boxed{v = 2.00 \times 10^8 \text{ m/s}}$$

$$5. \quad d = 1 \text{ m} = 10^{-3} \text{ m}$$

$$n = 1.46$$

$$v = \frac{c}{n} = \frac{3.00 \times 10^8 \text{ m/s}}{1.46}$$

$$v = 2.05 \times 10^8 \text{ m/s}$$

$$v = \frac{d}{t}$$

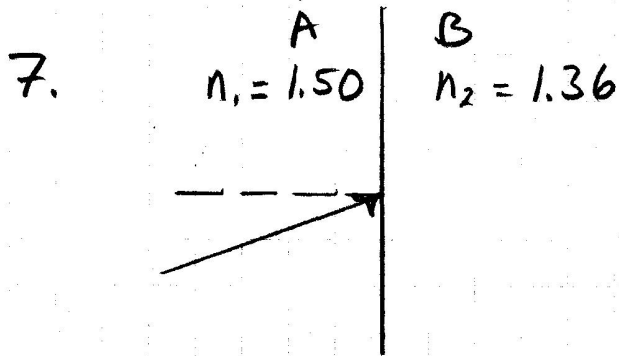
$$t = \frac{d}{v} = \frac{10^{-3} \text{ m}}{2.05 \times 10^8 \text{ m/s}}$$

$$\boxed{t = 4.88 \times 10^{-9} \text{ s}}$$

6. Relative index $n_{1 \rightarrow 2} = \frac{n_2}{n_1}$

When the light ray goes from an optically dense medium to a less dense medium, $n_1 > n_2$.

Therefore, $n_{1 \rightarrow 2} = \frac{n_2}{n_1} < 1$



Medium B is less refractive. The higher the index of refraction, n , the more refractive a medium is.