Review Quiz

Formulae and Constants:

Reflection/refraction
\[ n = \frac{c}{v} \quad \lambda_n = \frac{\lambda}{n} \]
Snell’s Law: \[ n_1 \sin \theta_1 = n_2 \sin \theta_2 \]

1. (a) Define dispersion.

(b) The graph below shows normal dispersion. Sketch a similar graph showing anomalous dispersion.

(c) Which color bends the most when it travels from glass into air (normal dispersion)?
   - red
   - blue
   - they are the same
   (Circle one.)
2. “Your” swimming pool has underwater lights built into the wall.

(a) Label the angle of incidence, \( \theta_i \), for the ray shown on the diagram,

(b) For the ray shown \( (\theta_i = 20.0^\circ) \), calculate the refracted angle.

(c) Draw the refracted ray on the diagram.

(d) Now draw a ray (starting at the light and ending in the air) for an incident angle < 20.0° AND for an incident angle > 20.0°.

(e) What is the refracted angle when the incident angle is equal to the critical angle – give a value – don’t say it doesn’t exist.

(f) Calculate the critical angle for light which begins underwater \( (n_w = 1.50) \) and ends in air \( (n_a = 1.00) \).
light