REFLECTION, REFRACTION, and DIFFRACTION

$$R = 2f$$

$$\frac{1}{d_o} + \frac{1}{d_i} = \frac{1}{f}$$

$$M = \frac{-d_i}{d_o} = \frac{h_i}{h_o}$$

$$c = 3.0 \times 10^8 \, m/s$$

$$n = \frac{c}{v}$$

$$n_i \sin\theta_i = n_r \sin\theta_r$$

$$\sin\theta_c = \frac{n_r}{n_i}$$

$$d \sin\theta = m\lambda$$

In addition to knowing how to answer the given questions and use the given formulas, be sure to review notes, quizzes, and worksheets, and know the meanings of these terms: Reflection, Concave, Convex, Real, Virtual, Refraction, Converging, Diverging, Total Internal Reflection, Diffraction

1.   A ray of light strikes a flat mirror, then reflects from the mirror making an angle of 35° with the mirror. Find the angle of incidence of the light ray.

2.   Describe all scenarios where an object can be placed in front of a mirror, when the image formed will be virtual and upright.

3.   Describe all scenarios where an object can be placed in front of a mirror, when the image formed will be magnified larger than the object.

4.   A 10cm-tall object is placed 12cm in front of a convex mirror that has a radius of curvature of 35cm. First, sketch a ray diagram to predict the attributes of the image. Then calculate the image position and height, and state whether the image is real or virtual, and upright or inverted.

5.   An object is placed 5cm in front of a concave mirror, and an upright image forms with a magnification of 1.3. What is the focal length of this mirror?

6.   When a ray of light passes from a material with a low n to a material with a higher n, the light's speed _____ and it bends _____ the normal.

7.   A substance has an index of refraction of 1.95. Calculate the speed of light in that material.

8.   A ray of light traveling through air is incident at an angle of 43° upon the surface of a glass prism. If the light is refracted to an angle of 29° as it enters the glass, calculate the index of refraction of this type of glass.