## Chapter 22 Reflection Practice Worksheet

The law of reflection states that when an object hits a surface, its angle of incidence will equal the angle of reflection. This is true when the object is light and the surface is a flat, smooth mirror. When the object and the surface are larger and lack smooth surfaces (like a basketball and a gym floor), the angles of incidence and reflection are nearly but not always exactly equal. The angles are close enough that understanding the law of reflection can help you improve your game.
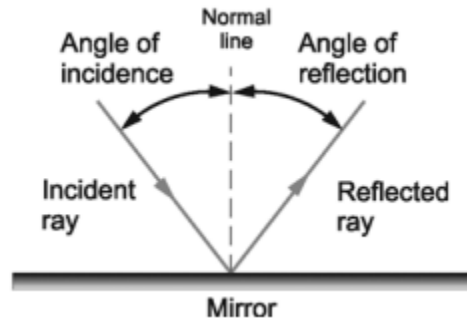

1. A light ray strikes a flat mirror with a 30° angle of incidence. Draw a ray diagram to show how the light ray interacts with the mirror. Label the normal line, the incident ray, and the reflected ray.
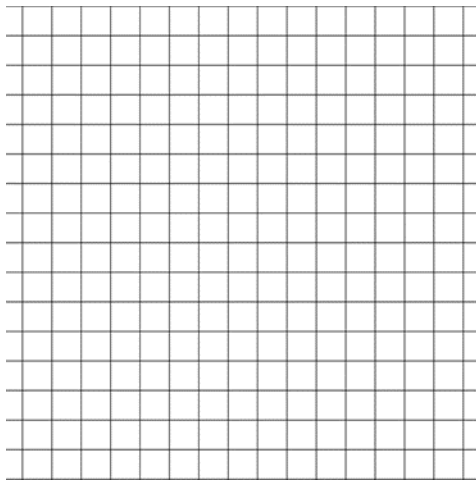
2. When we talk about angles of incidence and reflection, we often talk about the normal. The normal to a surface is an imaginary line that is perpendicular to the surface. The normal line starts where the incident ray strikes the mirror.

    a. Draw a diagram that shows a mirror with a normal line and a ray of light hitting the mirror at an angle of incidence of 60°.
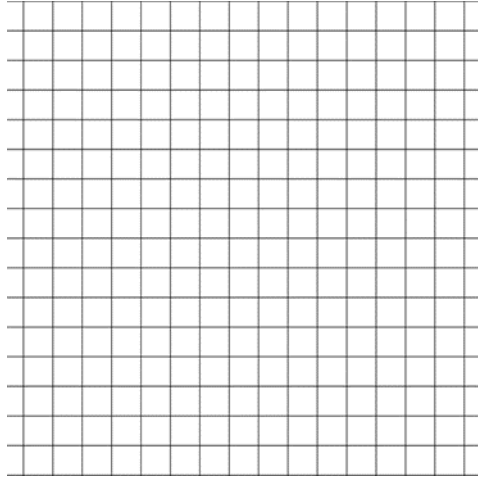
    b. In the diagram you draw above, label the angle of reflection. How many degrees is this angle of reflection?

3. Light strikes a mirror's surface at 20° to the normal. What will the angle of reflection be?

4. A ray of light strikes a mirror. The angle formed by the incident ray and the reflected ray measures 90°. What are the measurements of the angle of incidence and the angle of reflection?

5. In a game of basketball, the ball is bounced (with no spin) toward a player at an angle of 40° to the normal. What will the angle of reflection be? Draw a diagram that shows this play. Label the angles of incidence and reflection and the normal.
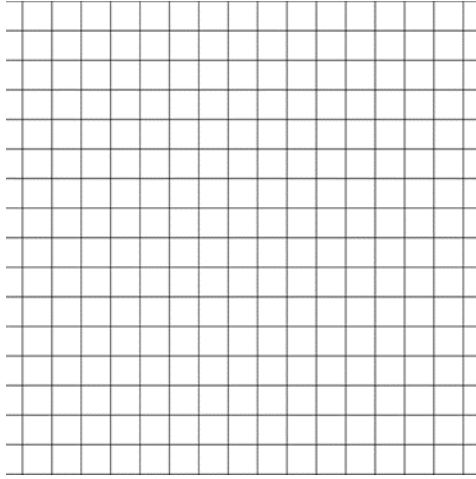
6. Use a protractor to determine the angels of incidence and reflection.

   a. Because a lot of her opponent's balls are in the way for a straight shot, Amy is planning to hit the cue ball of the side of the pool table so that it will hit the 8-ball into the corner pocket. In the diagram, show the angles of incidence and reflection for the path of the cue ball. How many degrees does each angle measure?

   cue ball hits here

   eight ball **8**   ◯ cue ball

   Amy wants the eight ball to go in this pocket
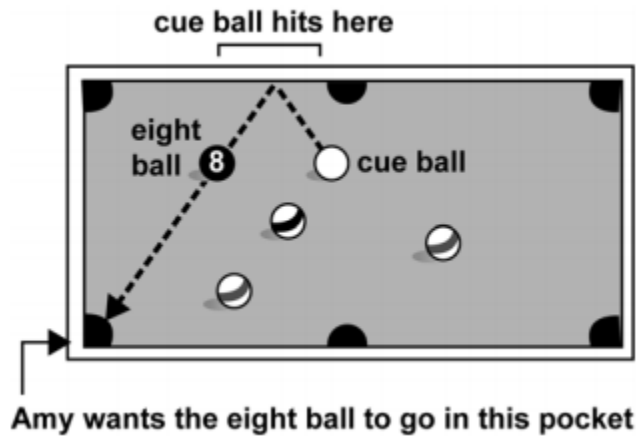
b. You and a friend are playing pool. You are playing solids and he is playing stripes. You have one ball left before you can try for the eight ball. Stripe balls are in the way. You plan on hitting the cue ball behind one of the stripe balls so that it will hit the solid ball and force it to follow the pathway shown in the diagram. Use your protractor to figure out what angles of incidence and reflection are needed at points A and B to get the solid ball into the far side pocket.

Point A