Name:

Skill Sheet 15-B   The Law of Reflection

The law of reflection works perfectly with light and the smooth surface of a mirror. However, you can apply this law to other situations. For example, how would the law of reflection help you win a game of pool or pass a basketball to a friend on the court?

In this skill sheet you will review the law of reflection and perform practice problems that utilize this law. Use a protractor to make your angles correct in your diagrams.

1. What is the law of reflection?

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, the angles of incidence and reflection are close but not always exact. Nevertheless, this law is very helpful in performing activities like bouncing a ball to someone or in playing pool.

1. 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.

    a. Draw a diagram that shows a surface, with a normal line, and a ray of light hitting the surface at an angle of incidence of 60 degrees.

    b. In the diagram above, label the angle of reflection. How many degrees is this angle of reflection?

2. Light strikes a mirror's surface at 30 degrees to the normal. What will the angle of reflection be?

3. The angle between the angle of incidence and angle of reflection for a light ray of light hitting a mirror is measured to be 90 degrees. What is the measurement for each of these angles?

4. In a game of basketball, the ball is bounced (with no spin) toward a player at an angle of 40 degrees 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.
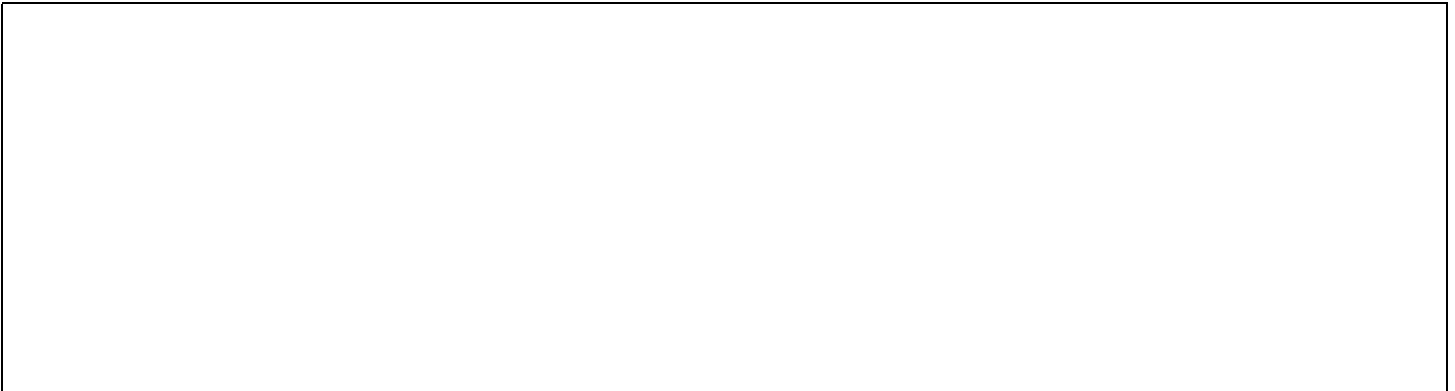
2. Playing pool

Use a protractor to figure out the angles of incidence and reflection for the following problems.

1. Because her opponent's balls are in the way for a straight shot, Amy is planning to hit the cue ball off 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
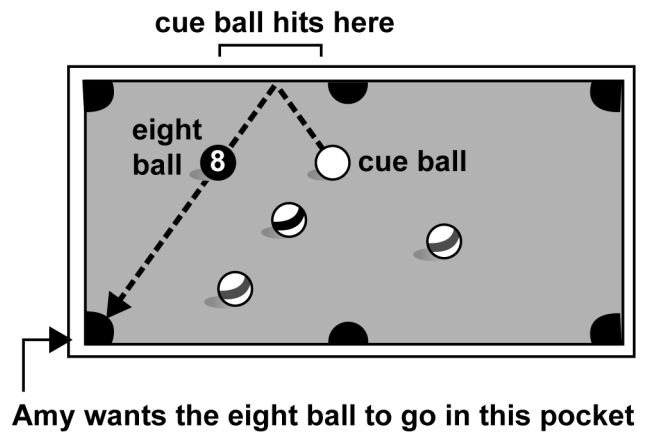
2. You and a friend are playing pool. You are playing solids and he is playing stripes. You have one ball left before you can try for the eight ball. Stripe balls are in the way. You plan on hitting the cue ball behind one of the stripe balls so that it will hit a solid ball and force it to follow the 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

Point B

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