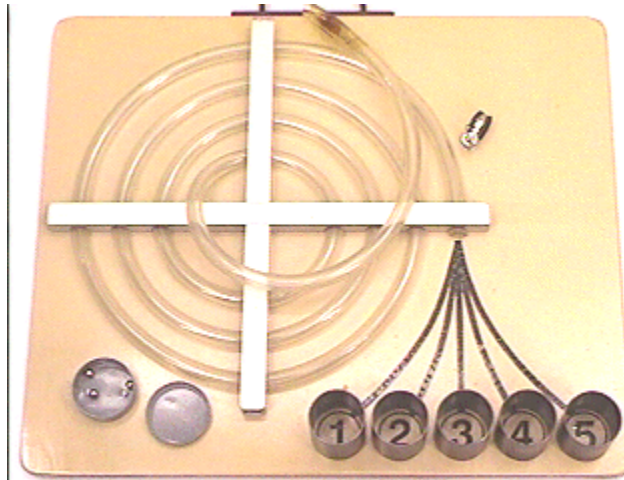# Question #44

A clear plastic tube, as shown in the photograph below, spirals outward, ending such that a tangent to the spiral is perpendicular to the radius from the center of the spiral to the open end.


A small ball bearing will be blown through the spiral tube, emerging from the end so that it strikes one of the aluminum tubes marked 1 through 5. The question is which of the tubes it will hit.

It might hit either 1 or 2, because the ball has a certain amount of "angular momentum." This angular momentum might cause the ball to continue moving in a circle, perhaps with a slightly greater radius, after it leaves the tube (region (c) on the drawing below).

On the other hand, if the ball is not held in its trajectory - for example by a string or the tube - it might be subject to a large amount of "centrifugal force." After the ball leaves the tube it might move in a somewhat outward path, so that it would hit either 4 or 5 (region (a) on the drawing below).

Or, perhaps it would just go straight and hit number 3 (region (b) on the drawing below).

What do you think will happen, and WHY?
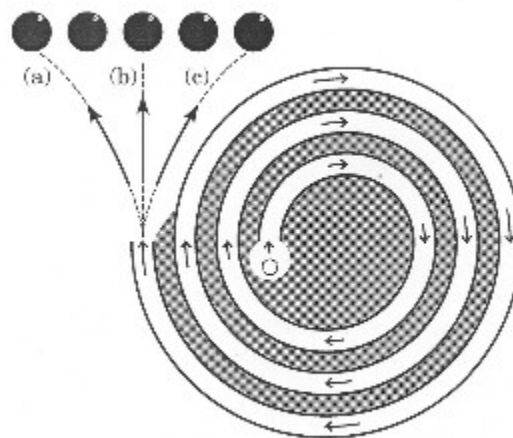
After the ball leaves the spiral tube it will:

- (a) hit either number 1 or 2 (region c).
- (b) hit either number 4 or 5 (region a).
- (c) hit number 3 (region b).

Click here for Answer #44 after December 25, 2000.

For questions and comments regarding the *Question of the Week* contact
Dr. Richard E. Berg by e-mail or using phone number or regular mail address
given on the Lecture-Demonstration Home Page.