

Math 403, section 1    **The return of the *MAGIC FROG!***    February 13, 2008

**Two students must work on this together!!!**

Name \_\_\_\_\_ Name \_\_\_\_\_

A frog starts at the origin. It leaps one unit eastward (to the right!) on its first jump,  $\frac{1}{2}$  unit on its second,  $\frac{1}{4}$  unit on its third,  $\frac{1}{8}$  on the fourth, and so on, each time turning exactly an angle  $\alpha$  to the left from the previous jump. Assuming only that  $0 < \alpha < \pi$ , show that this frog will always end up at some point on a semicircle of radius  $\frac{2}{3}$ . Sketch this semicircle on the axes provided below.

