Problem Description: An object moves at a constant rate of $10\frac{ft}{sec}$. It’s path is linear from $P$ to $S$. At $t = 0$ sec it leaves $P$. The object crosses a circular boundary. The circle has radius, $r = 50$ ft, and it is centered at the origin.

1. (10) Where does the object first enter the circular boundary? That is, what is the coordinate pair for the point $Q$?

2. (5) When is the object at the point $Q$?
3. (5) How long is the object *inside* the circular boundary?

4. (10) When is the object *closest* to the origin?