

Quiz #2: Electric Fields

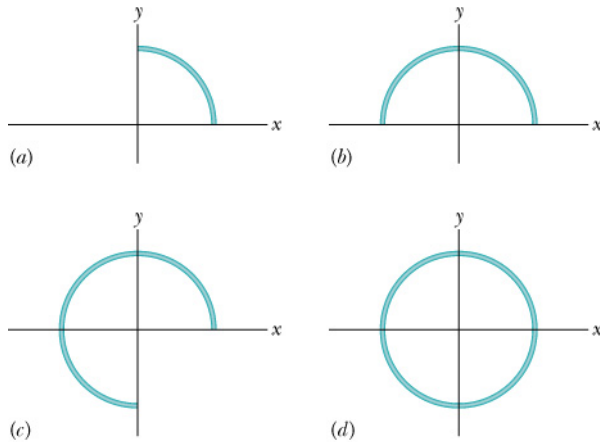
Problem 1 (2 points)

An electron traveling north enters a region where the electric field is uniform and points west. The electron:

- a) speeds up
- b) slows down
- c) veers east
- d) veers west
- e) continues with the same speed in the same direction

Problem 2 (3 points)

In Fig. *a*, a circular plastic rod with uniform charge $+Q$ produces an electric field of magnitude E at the center of curvature (at the origin). In Figs. *b*, *c*, and *d*, more circular rods, each with identical uniform charges $+Q$, are added until the circle is complete. A fifth arrangement (which would be labeled *e*) is like that in *d* except the rod in the fourth quadrant has charge $-Q$. Rank the five arrangements according to the magnitude of the electric field at the center of curvature, **greatest first**.



Problem 3 (5 points)

In the figure show below, instead of an electric dipole, assume that both charges are positive.

What is the electric field at point P, a distance z above the midpoint of the charges? Use the binomial expansion to simplify your answer in the limit that $z \gg d$.

