## Homework H.2.E

**Given:** Cable AB is wrapped around the outer perimeter of a stepped disk. End A of the cable is given a constant upward speed of  $v_A$ , and end B is connected to fixed ground. A second cable DQ is wrapped around the inner perimeter of the stepped disk. Blocks D and Q are attached to ends D and Q, respectively, of this cable. Assume that the cables do not slip on the disk as the system moves.

**Find:** For this problem:

- (a) Determine the speeds of blocks D and Q. Leave your answers in terms of  $v_A$ .
- (b) Determine the velocity of point E on the outer perimeter of the disk when E is directly above the center O of the disk. Write your answers as vectors. Leave your answers in terms of R and  $v_A$ .
- (c) Show the velocity vectors of D, Q and point E in a sketch of the system.

