C. Electric Field and Potential: Prelab questions

1. The following picture depicts equipotential lines (dashed, corresponding to constant voltage). Sketch the corresponding electric field lines. (Draw the electric field lines using solid lines.) Be sure to label the direction of the electric field lines using arrows given that $V_{\text{OUT}} < V_{\text{IN}}$.

![Diagram 1](image1)

2. On the diagram, for each of the two charges (one +, one -) put an arrow in the direction it would move if placed as shown and released from rest. These two cases are done separately; the positive and negative charges are not there at the same time.

![Diagram 2](image2)
3. The following picture depicts equipotential lines (dashed, corresponding to constant voltage). Label the two regions that have the strongest electric field and the two regions that have the weakest electric field. Next to the picture, explain your reasoning.

4. The following picture depicts several labeled equipotential lines (dashed, corresponding to constant potential). Calculate the electric field at the marked point using the derivative approximation. Be sure to find both $E_x$ and $E_y$, and write your final answer in vector notation.