Name_____ **Pd**____

Electric Potentials ws 5

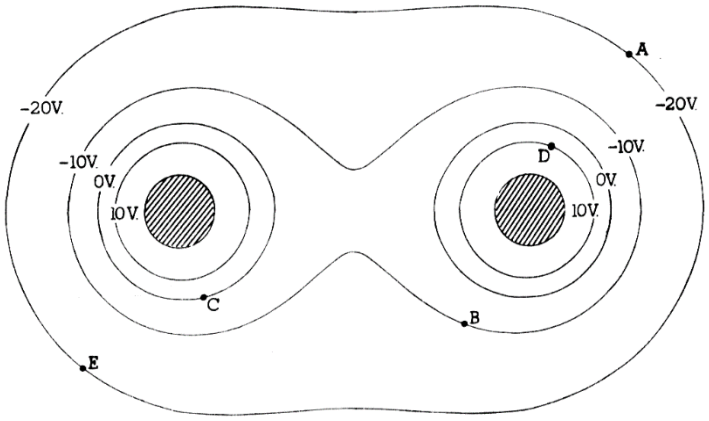
1) The electric potential at a single location is zero. Does this fact necessarily mean that the electric field at that same place is zero? Use a spot between two oppositely charged point charges as an example to support your reasoning.

2) A proton is fixed in place. An electron is released from rest and allowed to collide with the proton. Then the roles of the proton and electron are interchanged, and the same experiment is repeated. Which is traveling faster when the collision occurs, the proton or the electron? Justify your answer.

3) A positive test charge is placed in an electric field. In what direction should the charge be moved, relative to the field, such that the charge experiences a constant electric potential? Explain. Draw a picture.

4) Two equipotential surfaces surround a $+1.50 \times 10^{-8}$ –C point charge. How far is the 190 V surface from the 75.0 –V surface?

5) 3 charges each with a magnitude of 3 μC are on the corners of an equilateral triangle with sides of 1 mm. Two of the charges are positive and one is negative. What is the potential energy of this arrangement?



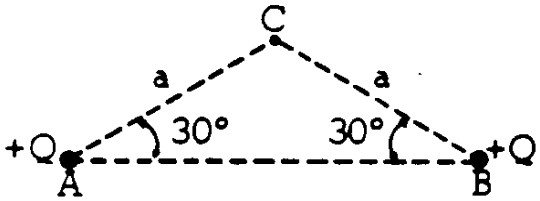
1974B5. The diagram shows some of the equipotentials in a plane perpendicular to two parallel charged metal cylinders. The potential of each line is labeled.

a. The left cylinder is charged positively. What is the sign of the charge on the other cylinder?

b. On the diagram above, sketch lines to describe the electric field produced by the charged cylinders.

c. Determine the potential difference, $V_A - V_B$, between points A and B.

d. How much work is done by the field if a charge of 0.50 coulomb is moved along a path from point A to point E and then to point D?



1975B2. Two identical electric charges +Q are located at two corners A and B of an isosceles triangle as shown above.

a. How much work does the electric field do on a small test charge +q as the charge moves from point C to infinity,

b. In terms of the given quantities, determine where a third charge +2Q should be placed so that the electric field at point C is zero. Indicate the location of this charge on the diagram above.