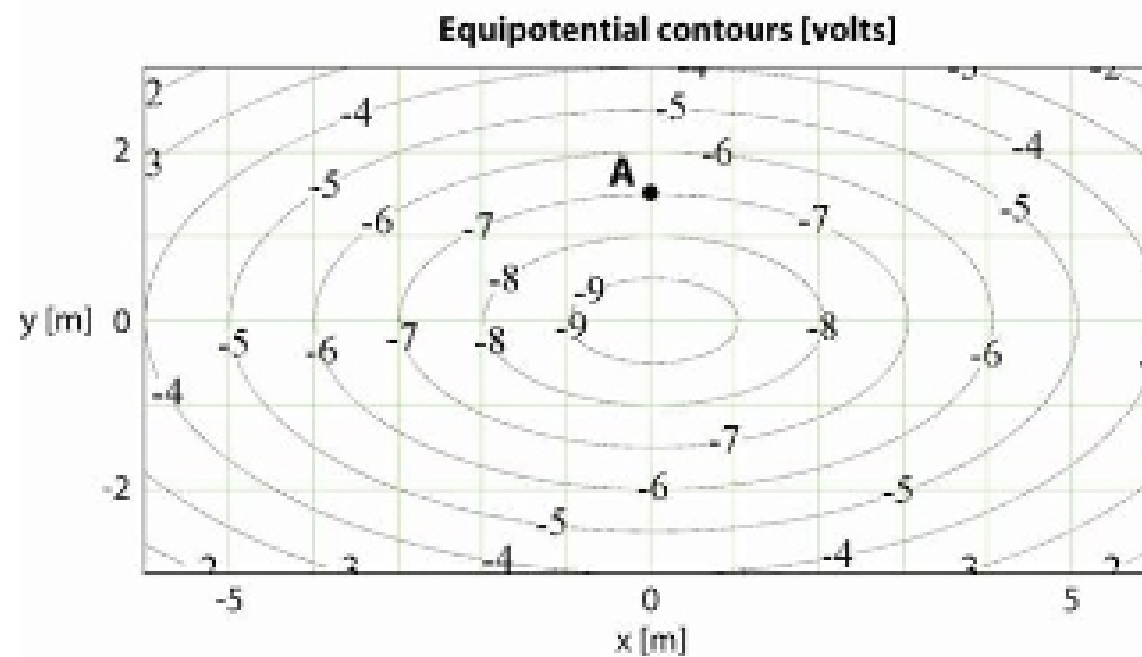


REVIEW: POTENTIAL EXAM QUESTIONS

The following questions are not part of your lab grade, **you won't be graded on the answers**. Questions like these – but not identical – may appear on the exam. You are welcome to discuss the questions and your answers with your fellow students or the instructors during your recitation/lab section.

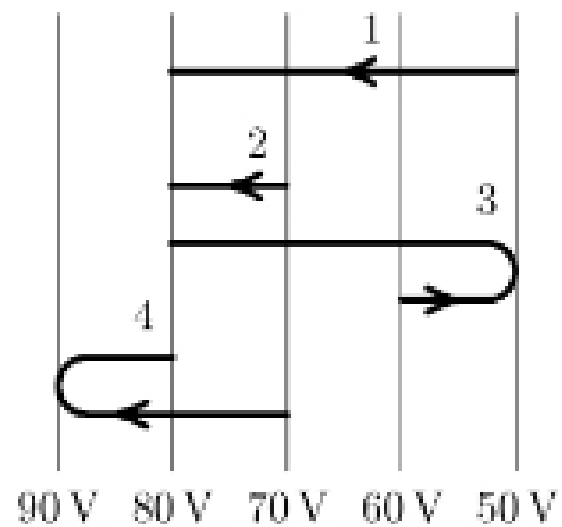
The diagram below shows the equipotential contours from an unknown charge distribution.



1. What is the magnitude of the electric field at point A?
 - a) 0.5 V/m
 - b) 1.0 V/m
 - c) 2.0 V/m
 - d) 4.7 V/m
 - e) 7.0 V/m

2. What is the direction of the electric field at point A?
 - a) +x
 - b) -x
 - c) +y
 - d) -y
 - e) Out of the page

3. An electron goes from one equipotential surface to another along one of the four paths shown in the diagram. Rank the paths according to the work done by the electric field, from least to greatest.



- a) $1 < 2 < 3 < 4$
 b) $4 < 3 < 2 < 1$
 c) $1 < 3 < 4 = 2$
 d) $4 = 2 < 3 < 1$
 e) $4 < 3 < 1 < 2$
4. Adding a dielectric material between the plates of a capacitor connected to a battery has what effect?
- a) It increases the electric field between the plates
 b) It decreases the energy stored in the capacitor
 c) It increases the charge on the plates
 d) It decreases the charge on the plates
 e) More than one of the above is true
5. If the plate area of an isolated charged parallel-plate capacitor is doubled,
- a) the electric field is doubled
 b) the potential difference is halved
 c) the charge on each plate is halved
 d) the surface charge density on each plate is doubled
 e) none of the above

6. Three uniform copper cylinders with equal length are machined. The first cylinder has twice the radius of the second (i.e. $r_1=2r_2$), and half the radius of the third (i.e. $r_1=r_3/2$). Which cylinder has the largest resistance?
- Cylinder 1
 - Cylinder 2
 - Cylinder 3
 - All three have the same resistance.
 - Two of them have equal resistance.

7. Which of the following statements is true?
- When a real light bulb is on, the current into one of its terminals must be slightly greater than the current out of its other terminal.
 - If two resistors are in series, the voltage difference across one resistor is always equal to the voltage difference across the other resistor.
 - If wires are not ideal (i.e. they have internal resistance), then the total current into any junction can be unequal to the total current out of this junction (A junction is where three or more wires meet).
 - In any circuit, the current is always flowing clockwise.
 - In any closed circuit involving just resistors and batteries, the physical electrons flow from regions of lower voltage towards regions of higher voltage, but the "conventional current" flows the other way.

8. How much current is being supplied by the 12 V battery in the diagram?

- 0.2 A
- 0.5 A
- 1.0 A
- 2.0 A
- 3.0 A

