

WORKSHEET 3: Electric Potential

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COURSE: Physics 40C (Fall 2018), Dr. Laura Sales

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Reminder

There are no stupid questions!

0 Review

Which surface has more electric flux? Surface A, Surface B, or equal? Explain why.



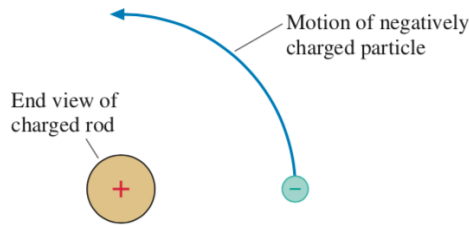
1 Electric Potential

1. Is the electric force $\vec{F} = q\vec{E}(\vec{r})$ (a) a conservative force, (b) a non-conservative force or (c) a mechanical force?
2. How do you determine if a force¹ is conservative?²

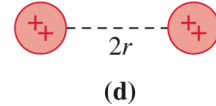
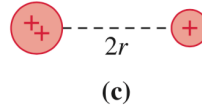
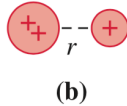
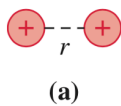
¹Or similarly, a “Vector Field.”

²Later in the quarter we will encounter the Lorentz Force which will put these definitions to the test.

3. A glass rod is positively charged. The figure below shows the end view of a rod. A negatively charged particle moves in a circular arc around the glass rod. Is the work done on the charged particle by the rod's electric field (a) **positive**, (b) **negative** or (c) **zero**?



4. Rank in order, from largest to smallest, the potential energies U_a to U_d of these four charge pairs. Each $+$ symbol represents the same amount of charge.



5. A proton is released from rest at point B, where the potential is 0 V. Afterward, the proton
- Remains at rest at B.
 - Moves toward A with a steady speed.
 - Moves toward A with an increasing.
 - Moves toward C with a steady speed.
 - Moves toward C with an increasing speed.

