WebAssign
CH17-HW01-FALL2010 (Homework)

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PHYS 272-FALL 2012, Fall 2012
Instructor: Virendra Saxena

Current Score : 29 / 29 **Due :** Tuesday, September 18 2012 11:59 PM EDT

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1. 1/1 points | Previous Answers MI3 17.1.X.020

What is the kinetic energy of a proton that is traveling at a speed of 2300 m/s?

K = 4.42e-21 ✓ J

- *Read the eBook*
- Section 17.1

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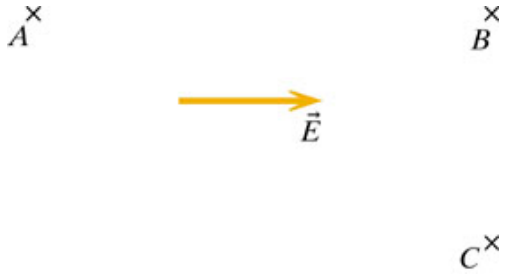
2. 1/1 points | Previous Answers MI3 17.1.X.021

If the kinetic energy of an electron is 3.1e-18 J, what is the speed of the electron? (You can use the approximate (nonrelativistic) formula here.)

v = 2608775.19 ✓ m/s

- *Read the eBook*
- Section 17.1

3. 5.5/5.5 points | Previous Answers MI3 17.3.X.030



Locations *A*, *B*, and *C* are in a region of uniform electric field, as shown in the diagram above. Location *A* is at < -0.3, 0, 0> m. Location *B* is at < 0.3, 0, 0> m. In the region the electric field $\vec{E}$ = < 750, 0, 0> N/C.

For a path starting at *B* and ending at *A*, calculate:

(a) The displacement vector $\Delta\vec{l}$

$\Delta\vec{l}$ =

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✔ m

(b) the change in electric potential:

ΔV = 450 ✔ volts

(c) the potential energy change for the system when a proton moves from *B* to *A*:

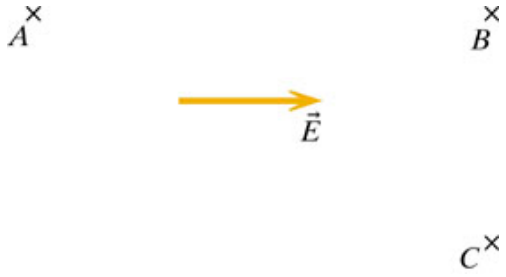
ΔU = 7.2e-17 ✔ joules

(d) the potential energy change for the system when an electron moves from *B* to *A*:

ΔU = -7.2e-17 ✔ joules

- *Read the eBook*
- Section 17.3

4. 7.5/7.5 points | Previous Answers MI3 17.3.X.031



Locations *A*, *B*, and *C* are in a region of uniform electric field, as shown in the diagram above. Location *B* is at < 0.4, 0, 0 > m. Location *C* is at < 0.4, -0.2, 0 > m. In the region the electric field $\vec{E}$ = < 750, 0, 0> N/C.

For a path starting at *B* and ending at *C*, calculate:

(a) The displacement vector $\Delta\vec{l}$

$\Delta\vec{l}$ = < 0 ✓ , -0.2 ✓ , 0 ✓ > m

(a) the change in electric potential:

ΔV = 0 ✓ volts

(b) the potential energy change for the system when a proton moves from *B* to *C*:

ΔU = 0 ✓ joules

(c) the potential energy change for the system when an electron moves from *B* to *C*:

ΔU = 0 ✓ joules

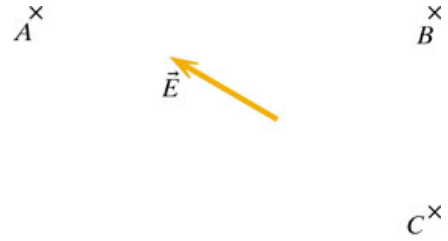
Which of the following statements are true in this situation? Check all that apply.

- [x] $\Delta\vec{l}$ is perpendicular to $\vec{E}$
- [x] When a proton moves along this path, the electric force does zero net work on the proton
- [ ] The potential difference cannot be zero because the electric field is not zero along this path

✓

- *Read the eBook*
- Section 17.3

5. 5.5/5.5 points | Previous Answers MI3 17.3.X.032



Locations *A*, *B*, and *C* are in a region of uniform electric field, as shown in the diagram above. Location *A* is at < -0.3, 0, 0>m. Location *B* is at < 0.5, 0, 0>m. In the region the electric field $\vec{E}$ = < -550, 350, 0> N/C.

For a path starting at *A* and ending at *B*, calculate:

(a) The displacement vector $\Delta\vec{l}$

$\Delta\vec{l}$ = < 0.8 ✓ , 0 ✓ , 0 ✓ > m

(a) the change in electric potential:

ΔV = 440 ✓ volts

(b) the potential energy change for the system when a proton moves from *A* to *B*:

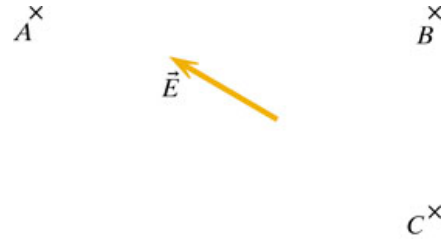
ΔU = 7.04e-17 ✓ joules

(c) the potential energy change for the system when an electron moves from *A* to *B*:

ΔU = -7.04e-17 ✓ joules

- *Read the eBook*
- Section 17.3

6. 6.5/6.5 points | Previous Answers MI3 17.3.X.033



Locations *A*, *B*, and *C* are in a region of uniform electric field, as shown in the diagram above. Location *A* is at < -0.3, 0, 0>m. Location *C* is at < 0.4, -0.3, 0>m. In the region the electric field $\vec{E}$ = < -750, 450, 0> N/C.

For a path starting at *C* and ending at *A*, calculate:

(a) The displacement vector $\Delta\vec{l}$

$\Delta\vec{l}$ = < -0.7 , 0.3 , 0 > m

(a) the change in electric potential:

ΔV = -660 volts

(b) the potential energy change for the system when a proton moves from *C* to *A*:

ΔU = -1.056e-16 joules

(c) the potential energy change for the system when an electron moves from *C* to *A*:

ΔU = 1.056e-16 joules

- *Read the eBook*
- Section 17.3

7. 2/2 points | Previous Answers MI3 17.3.X.034

You move from location *i* at < 5, 5, 6 > m to location *f* at < 8, 7, 11 > m. All along this path there is a nearly uniform electric field $\vec{E}$ = < 1200, 200, -510 > N/C. Calculate $\Delta V = V_f - V_i$, including sign and units.

-1450 V

- *Read the eBook*
- Section 17.3