We derived that the electric field due to an infinite sheet with charge density σ was as follows:

$$\mathbf{E}(z) = \begin{cases} \frac{\sigma}{2\varepsilon_0}\hat{k} & \text{if} \quad z > 0 \\ \frac{-\sigma}{2\varepsilon_0}\hat{k} & \text{if} \quad z < 0 \end{cases}$$

What does that tell you about the difference in the field when we cross the sheet, $\mathbf{E}(+z) - \mathbf{E}(-z)$?

A. it's zero
B. it's $\frac{\sigma}{\varepsilon_0}$
C. it's -$\frac{\sigma}{\varepsilon_0}$
D. it's +$\frac{\sigma}{\varepsilon_0}\hat{k}$
E. it's -$\frac{\sigma}{\varepsilon_0}\hat{k}$

ANNOUNCEMENTS

- Homework 2 solutions posted
- Exam 1 is coming up! October 5th (More details next week!)

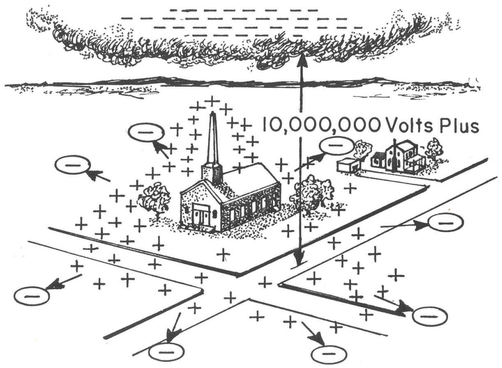
For me, the second homework was ...

A. fairly straight-forward; lower difficulty than I expected.
B. challenging, but at the level of difficulty I expected
C. a bit more difficult than I expected, but still manageable
D. much more difficult than I expected.

I spent ... hours on the second homework.

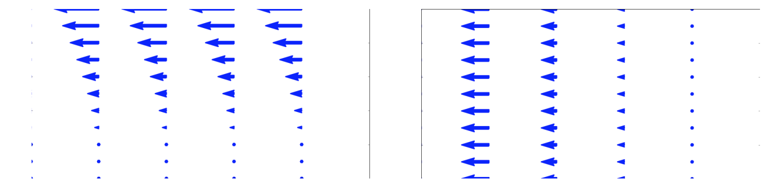
A. 1-4
B. 5-6
C. 7-8
D. 9-10
E. More than 10

ELECTRIC POTENTIAL



Which of the following two fields has zero curl?

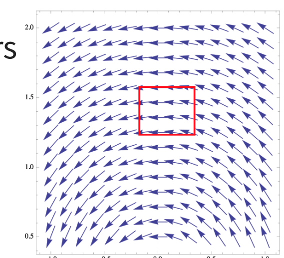
I	II



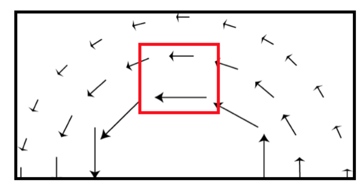
A. Both do.
B. Only I is zero
C. Only II is zero
D. Neither is zero
E. ???

What is the curl of the vector field, $\mathbf{v} = c\hat{\phi}$, in the region shown below?

A. non-zero everywhere
B. zero at some points, non-zero at others
C. zero curl everywhere

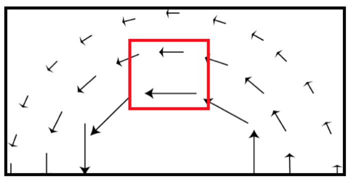


What is the curl of this vector field, in the red region shown below?



A. non-zero everywhere in the box
B. non-zero at a limited set of points
C. zero curl everywhere shown
D. we need a formula to decide

What is the curl of this vector field, $\mathbf{v} = \frac{c}{s}\hat{\phi}$, in the red region shown below?



A. non-zero everywhere in the box
B. non-zero at a limited set of points
C. zero curl everywhere shown

Is it mathematically ok to do this?

$$\mathbf{E} = \frac{1}{4\pi\varepsilon_0}\int_V \rho(\mathbf{r}')d\tau' \left(-\nabla\frac{1}{\mathfrak{R}}\right)$$

$$\longrightarrow \mathbf{E} = -\nabla\left(\frac{1}{4\pi\varepsilon_0}\int_V \rho(\mathbf{r}')d\tau' \frac{1}{\mathfrak{R}}\right)$$

A. Yes
B. No
C. ???

If $\nabla \times \mathbf{E} = 0$, then $\oint_C \mathbf{E} \cdot d\mathbf{l} =$

A. 0
B. something finite
C. ∞
D. Can't tell without knowing C

Can superposition be applied to electric potential, V?

$$V_{tot} \stackrel{?}{=} \sum_i V_i = V_1 + V_2 + V_3 + \ldots$$

A. Yes
B. No
C. Sometimes