Announcements

- Homework
  - Homework 11 due tonight!
  - I'm aiming to get HW12 (the last one!) out by this evening
- I'm handing back the take-home portions (or you already got an email from me)
- I'm working on getting a new grade report out so you can have a good idea where you stand going into the last stretch.
- Finish reading 7.1 and read 7.2.1 by Friday

Q1

What are the units for the area under a $\vec{\mathbf{H}}$-$\vec{\mathbf{B}}$ hysteresis curve?

A. $\dfrac{\mathrm{T}^2\,\mathrm{A}}{\mathrm{N}}$

B. $\dfrac{\mathrm{N}}{\mathrm{m}^2}$

C. T^2

D. $\dfrac{\mathrm{T}\,\mathrm{A}}{\mathrm{N}^2}$

Time to Meditate

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Q2

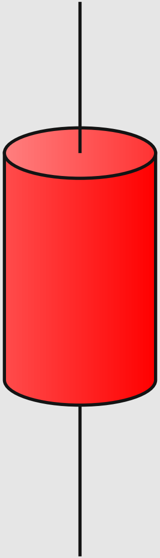
A thin electric current $\mathcal{I}$ flows along a copper wire (low resistivity) into a thick resistor made of carbon (high resistivity), then back into another copper wire. In which material is the electric field the largest?

A. In the copper wire

B. In the carbon resistor

C. It is the same in both copper and carbon

D. It depends on the exact sizes of copper wire and carbon resistor



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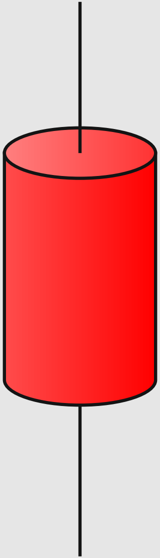
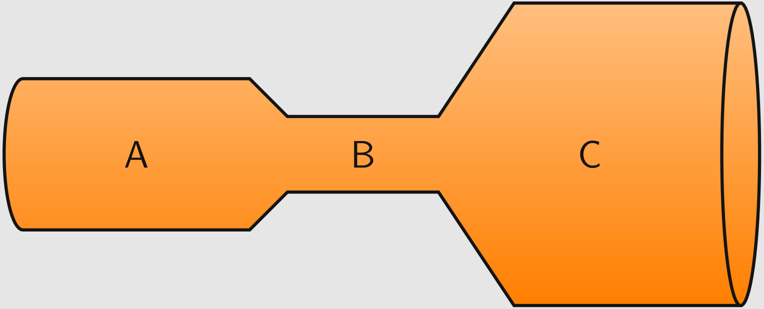


Time to Meditate

A copper cylinder is machined to have the below shape. The ends are then connected to a battery so that a current flows through the copper.



Rank order (from greatest to smallest including ties) the:

- Magnitude of $\vec{\mathbf{E}}$
- Conductivity
- Current
- Current density

in the labeled regions.

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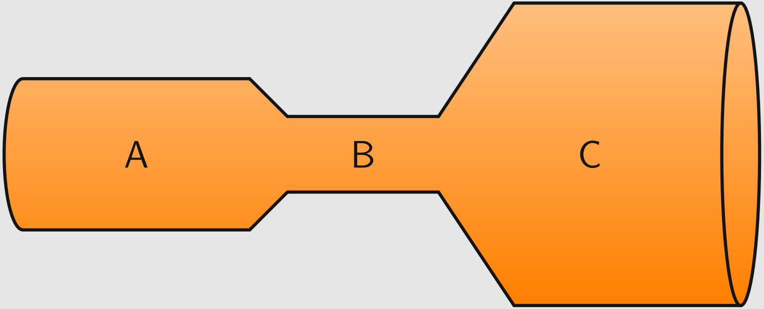


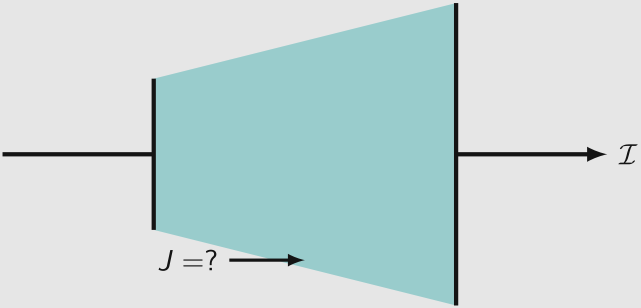
Rank order (from greatest to smallest including ties) the:

- Magnitude of $\vec{\mathbf{E}}$ $B > A > C$
- Conductivity $A = B = C$
- Current $A = B = C$
- Current density $B > A > C$

in the labeled regions.

Q3

Inside this resistor setup, what can you conclude about the current density $\vec{\mathbf{J}}$ near the side walls (in steady state)?



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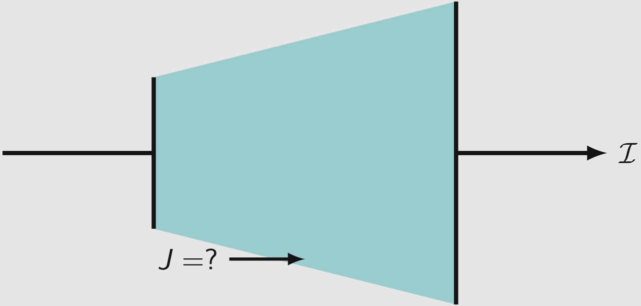

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Time to Meditate

Q4

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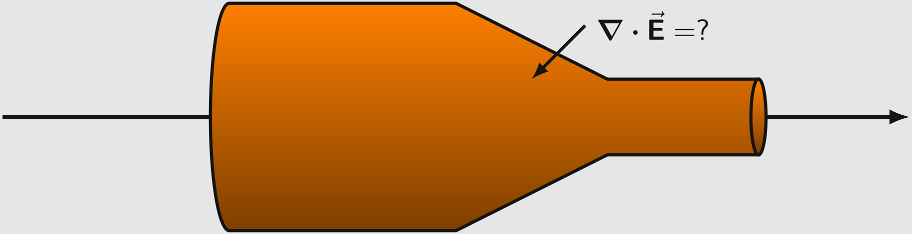

A. $\nabla \cdot \vec{\mathbf{E}} = 0$
B. $\nabla \cdot \vec{\mathbf{E}} > 0$
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D. It depends on how quickly the copper narrows

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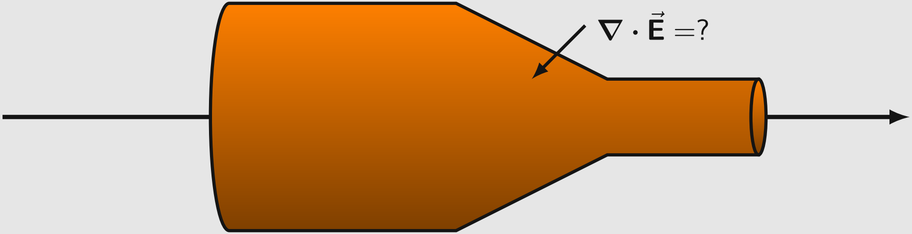

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