

# task\_ddjurcpk494go2q1\_with\_calculation

## Student Group

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electric field, magnetic field, exam ee2 SS2024

**Exercise E1 Capacitor**

(written test, approx. 12 % of a 120-minute written test, SS2024)

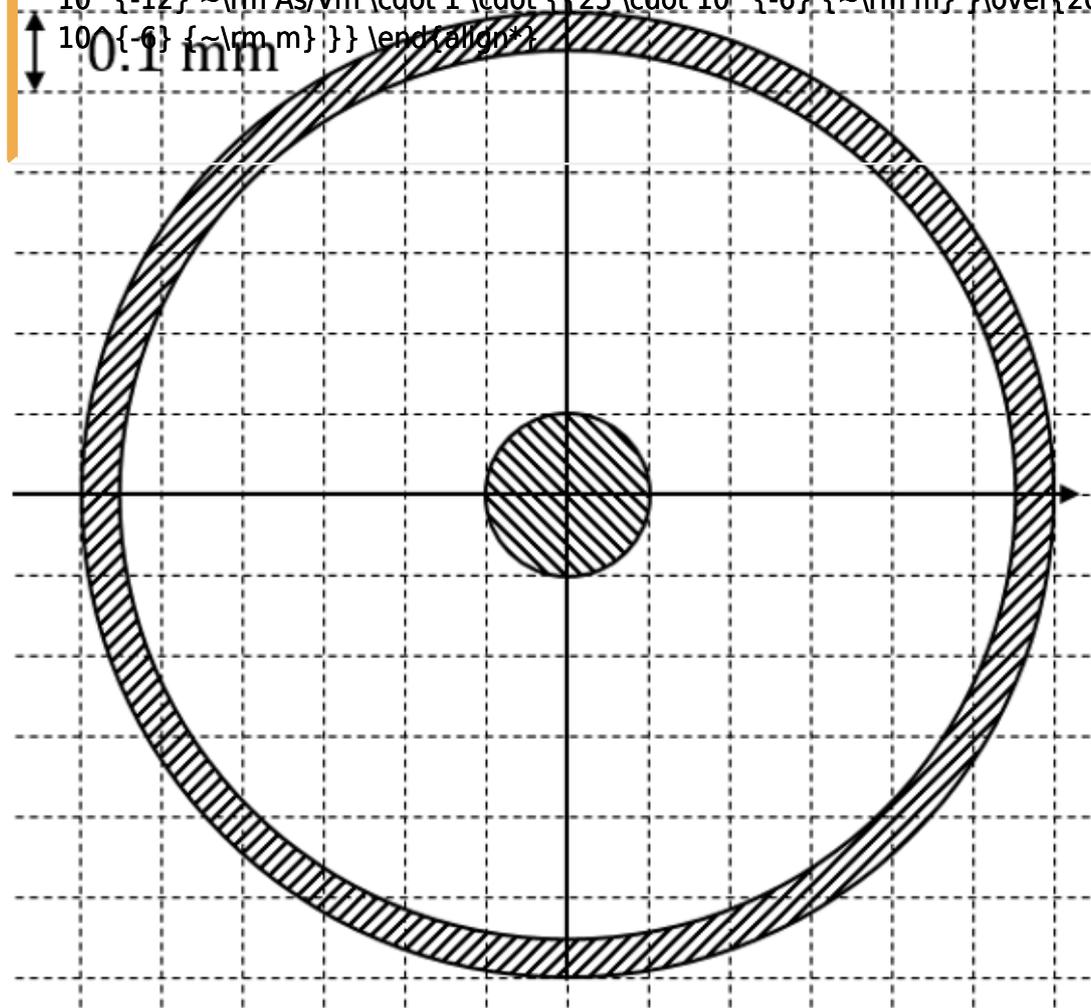
1. On the graph of the magnitude of  $B(r)$  from the previous question, the  $B(r)$  is  $0.1 \text{ mT}$  at  $r = 0.55 \text{ mm}$ . On the graph, use proper dimensions instead of letters for the coordinate. Due to the given load, the following situation appears:

Path

- Inner conductor:  $+3.3 \text{ mA}$ ,  $+10 \text{ nC}$  (current into the plane of the diagram)
- Outer conductor:  $-3.3 \text{ mA}$ ,  $0 \text{ nC}$  (current out of the plane of diagram)

$$C = \epsilon_0 \epsilon_r \frac{A}{d} = 8.854 \cdot 10^{-12} \frac{\text{As/Vm} \cdot 1 \cdot [25 \cdot 10^{-6} \text{ m}]}{200 \cdot 10^{-6} \text{ m}}$$

0.1 mm



1. What is the magnitude of the magnetic field strength  $H$  at  $(-0.1 \text{ mm} | 0)$  and  $(0.55 \text{ mm} | 0)$ ?

Path

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\begin{align*} C &= \varepsilon_0 \varepsilon_r \left\{ \frac{A}{d} \right\} \parallel \&= 8.854 \cdot 10^{-12} \frac{\text{As/Vm} \cdot 1 \cdot \{25 \cdot 10^{-6} \text{ m}\}}{200 \cdot 10^{-6} \text{ m}} \end{align*}
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