task_ddjurcpk494go2q1_with_calculation

Student Group

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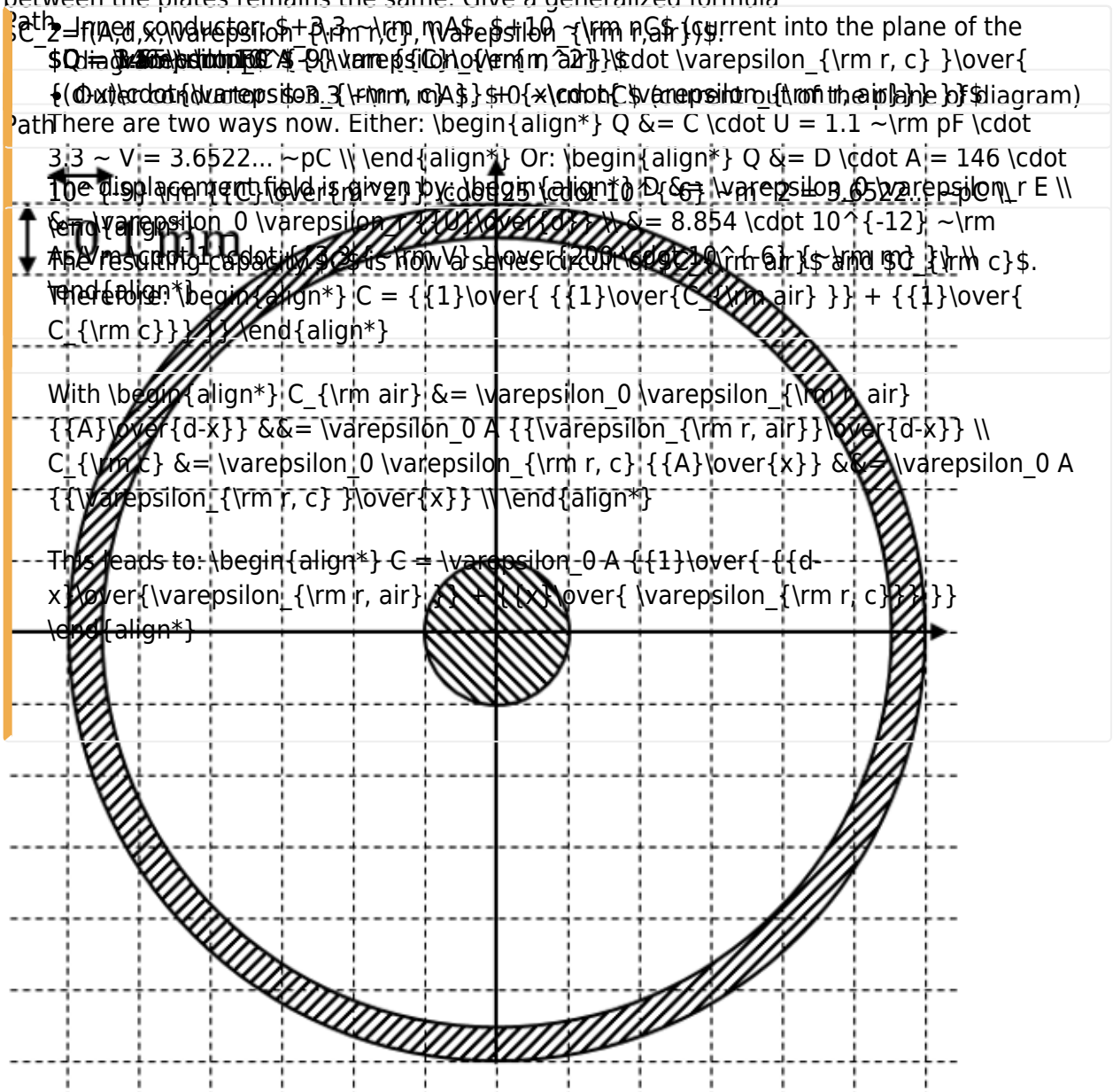
electric field, magnetic field, exam ee2 SS2024

Exercise E1 Capacitor
(written test, approx. 12 % of a 120-minute written test, SS2024)



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

2. Plot the graph of the magnitude of $H(x)$ from $\rm (-0.6 ~mm | 0)$ to $\rm (0.6 ~mm | 0)$ in one diagram. Use proper dimensions and labels for the diagram!

3. What is the magnitude of the electric displacement field D at $\rm (-0.1 ~mm | 0)$ and $\rm (0.55 ~mm | 0)$?

4. Plot the graph of the magnitude of $D(x)$ from $\rm (-0.6 ~mm | 0)$ to $\rm (0.6 ~mm | 0)$ in one diagram. Use proper dimensions and labels for the diagram!

Path

$$\begin{align*} C &= \varepsilon_0 \varepsilon_r {{A}\over{d}} \\ &= 8.854 \cdot 10^{-12} ~\rm As/Vm \cdot 1 \cdot {{25 \cdot 10^{-6} {~\rm m} }\over{200 \cdot 10^{-6} {~\rm m} }} \end{align*}$$