

# task\_ddjurcpk494go2q1\_with\_calculation

## Student Group

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Exercise E8 Fields of an coax Cable (written test, approx. 12 % of a 120-minute written test, SS2024) ..... 2



The magnitude of the magnetic field strength  $H$  can be calculated by:  $H = \frac{I}{2 \pi \cdot r}$

So, we get for  $H_{\text{i}}$  at  $r_{\text{i}} = 0.1 \text{ mm}$ , and  $H_{\text{o}}$  at  $r_{\text{o}} = 0.55 \text{ mm}$ :

$$\begin{aligned} H_{\text{i}} &= \frac{I}{2 \pi \cdot r_{\text{i}}} = \frac{+3.3 \text{ A}}{2 \pi \cdot 0.1 \cdot 10^{-3} \text{ m}} \\ H_{\text{o}} &= \frac{I}{2 \pi \cdot r_{\text{o}}} = \frac{+3.3 \text{ A}}{2 \pi \cdot 0.55 \cdot 10^{-3} \text{ m}} \end{aligned}$$

Hint: For the direction, one has to consider the right-hand rule. By this, we see that the  $H$ -field on the right side points downwards.

Therefore, the sign of the  $H$ -field is negative.

But here, only the magnitude was questioned!

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Last update: **2024/07/15 21:37**

