

# task\_kmp8r8y6lvwjnoc3\_with\_calculation

## Student Group

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## magnetic potential, exam ee2 SS2024

**Exercise E9 Magnetic Potential****(written test, approx. 8 % of a 120-minute written test, SS2024)**

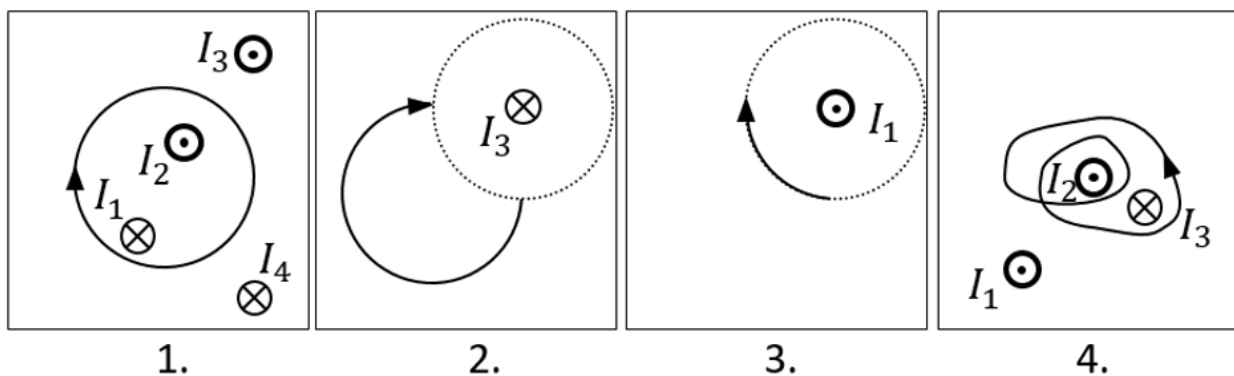
Calculate the magnetic potential difference  $\int \vec{V} \cdot d\vec{s}$  for the following paths as shown by the solid lines.

Dotted lines are only for there for symmetry aspects!

The wires conduct the following currents:

- $|I_1| = 2 \text{ A}$
- $|I_2| = 5 \text{ A}$
- $|I_3| = 11 \text{ A}$
- $|I_4| = 7 \text{ A}$

Pay attention to the signs of the currents (given by the diagrams) and of the results!



Result

Based on the right-hand rule and the part of a full revolution the following results:

1. Task:  $\int I_1 - I_2 = -3 \text{ A}$
2. Task:  $\int \frac{1}{4} I_3 = 11/4 \text{ A}$  (it does not matter which way the path goes from the startpoint to the endpoint, as long as it has the same direction and number of revolutions)
3. Task:  $-\int \frac{1}{4} I_1 = -0.5 \text{ A}$
4. Task:  $\int 2 \cdot I_2 - 1 \cdot I_3 = -1 \text{ A}$

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