

## Homework 3 - Maxwell's equations

Q3.1. Write Maxwell's equations in integral form and explain their meaning.

Q3.2. What is the physical meaning of

(a)  $\underline{\underline{J}} \cdot \underline{\underline{v}}$

(b)  $\underline{\underline{E}} \wedge \underline{\underline{j}}$

Q3.3. Draw a three-dimensional diagram illustrating the electric flux generated by a charge.

Q3.4. A current flows steadily in a straight line from  $A$  to  $B$ . Draw a two-dimensional diagram, suppressing one external dimension, illustrating the behaviour of the charge, current, electric flux and magnetic field. Explain how the orientations should be extended in the third dimension.