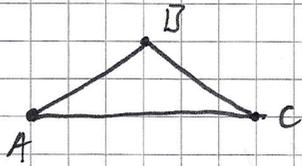


$$\oint \vec{E} d\vec{s} = 0$$



$$\Rightarrow \int_A^B \vec{E}_1 d\vec{s}_1 + \int_B^C \vec{E}_2 d\vec{s}_2 + \int_C^A \vec{E}_3 d\vec{s}_3 = 0$$

$$U_1 + U_2 + U_3 = 0$$

feldtheoretischer Beweis für den  
Maschensatz

$\varphi \rightarrow$  Potenzial

$$U_{AB} = \int_A^B \vec{E} d\vec{s} = \int_A^\infty \vec{E} d\vec{s} + \int_\infty^B \vec{E} d\vec{s}$$

$$U_{AB} = \int_A^\infty \vec{E} d\vec{s} - \int_B^\infty \vec{E} d\vec{s} = \varphi_A - \varphi_B$$

$$\varphi_A = \int_A^\infty \vec{E} d\vec{s} = \frac{U_{AB}}{Q}$$

Punktladung + Q:



$$\varphi_r = \int_r^\infty \vec{E} d\vec{s} = \int_r^\infty \frac{Q}{4\pi\epsilon r^2} dr$$

$$\varphi_r = \frac{Q}{4\pi\epsilon r}$$

