$$\vec{B} \leftarrow \int d^3r' \, \frac{\vec{J} \times (\vec{r} - \vec{r}')}{|\vec{r} - \vec{r}'|^3}$$

$$\frac{I}{A} = J$$

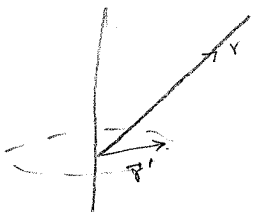
$$\delta(r-a)$$

$$J = I\,\delta(r-a)$$

$$\int a\,d\phi \; I$$

Circular wire (include this in Electromagnetism ⑦)

① Evaluate $\vec{A}(\vec{r})$ and $\vec{B}(\vec{r})$ due to a circular wire.



② Choose the plane such that

$$\vec{r} = (r\sin\theta, 0, r\cos\theta)$$

$$\vec{r}' = (r'\cos\phi, r'\sin\phi, 0)$$

$$\Rightarrow \vec{r}\cdot\vec{r}' = rr'\sin\theta\cos\phi.$$

③ $$\vec{A}(\vec{r}) = \frac{Ia}{c}\,\hat{\phi} \int_0^{2\pi} \frac{d\phi}{\sqrt{r^2 + a^2 - 2ar\sin\theta\cos\phi}}$$

↓

elliptic integral