2. Anwendung des Gesetzes von Biot-Savart – „Haarnadel“

$$d\vec{B}_1 = \frac{\mu_0 I}{4\pi} \frac{d\vec{l} \times \vec{r}}{r^3} = \frac{\mu_0 I}{4\pi} \frac{dl \sin(\theta)}{r^2} = \frac{\mu_0 I}{4\pi} \frac{d\varphi R^2}{r^3}$$

$$B_1 = \frac{\mu_0 I}{4\pi} \frac{R^2}{r^3} \int_0^\pi 1 \, d\varphi = \frac{\mu_0 I}{4} \frac{R^2}{r^3}$$

$$d\vec{B}_2 = \frac{\mu_0 I}{4\pi} \frac{d\vec{l} \times \vec{r}}{r^3} = \frac{\mu_0 I}{4\pi} \frac{dl \sin(\theta)}{r^2} = \frac{\mu_0 I}{4\pi} \frac{dl R}{r^3}$$