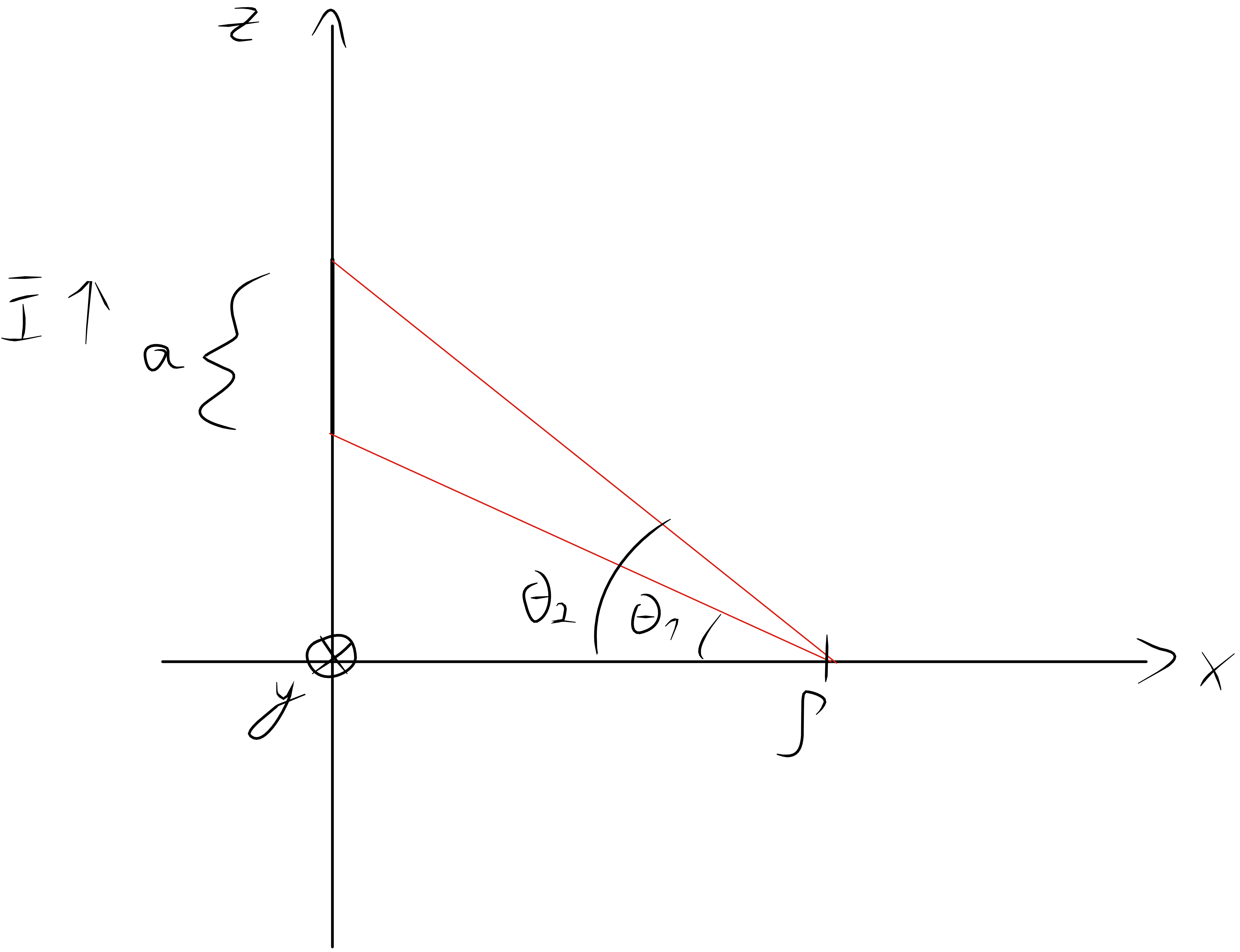

$$d\bar{B} = \frac{\mu_0 I}{4\pi} \cdot \frac{d\bar{l} \times (\bar{r} - \bar{r}')}{|\bar{r} - \bar{r}'|^3}$$

$$d\bar{l} = dz\, \hat{e}_z = x \sec^2\theta \, d\theta \, \hat{e}_z$$

$$z = x \tan\theta$$

$$dz = x \sec^2\theta \, d\theta$$

$$\bar{r} - \bar{r}' = -x \tan\theta \, \hat{e}_z + x\, \hat{e}_x$$

$$d\bar{l} \times (\bar{r} - \bar{r}') = \begin{bmatrix} 0 \\ 0 \\ x \sec^2\theta \, d\theta \end{bmatrix} \times \begin{bmatrix} x \\ 0 \\ x \tan\theta \end{bmatrix} = \begin{bmatrix} 0 \\ x^2 \sec^2\theta \, d\theta \\ 0 \end{bmatrix}$$

$$d\bar{B} = \frac{\mu_0 I}{4\pi} \cdot \frac{x^2 \sec^2\theta \, d\theta}{\left(x\sqrt{1+\tan^2\theta}\right)^3} \hat{e}_y = \frac{\mu_0 I}{4\pi} \cdot \frac{d\theta}{x \sec\theta} \hat{e}_y = \frac{\mu_0 I}{4\pi x} \cos\theta \, d\theta \, \hat{e}_y$$

$$\bar{B} = \frac{\mu_0 I}{4\pi x} \int_{\theta_1}^{\theta_2} \cos\theta \, d\theta \, \hat{e}_y = \frac{\mu_0 I}{4\pi x} \left(\sin\theta_2 - \sin\theta_1 \right) \hat{e}_y$$

$$\theta_1 \longrightarrow -\frac{\pi}{2} \qquad \bar{B} = \frac{\mu_0}{2\pi x} \hat{e}_y$$

$$\theta_2 \longrightarrow \frac{\pi}{2}$$