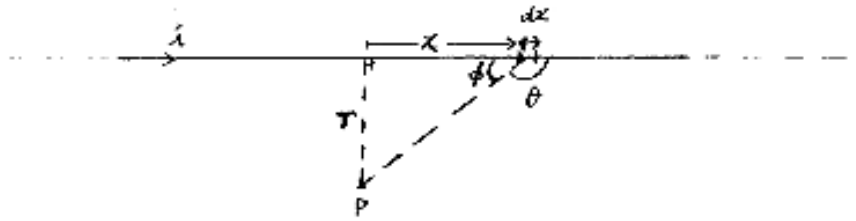
Field outside a very long straight wire.



$$dB = \frac{\mu_0 \lambda}{4\pi} \frac{dx \sin\theta}{r^2 \csc^2\phi}$$

$$= \frac{\mu_0 \lambda}{4\pi r^2} \sin^3\phi \, dx$$

$$x = r \cot\phi$$

$$\therefore \quad dx = -r \csc^2\phi \, d\phi$$

$$\therefore \quad dB = -\frac{\mu_0 \lambda}{4\pi r} \sin\phi \, d\phi$$

$$\therefore \quad B = \int dB$$

$$= -\frac{\mu_0 \lambda}{4\pi r} \int_{\pi}^{0} \sin\phi \, d\phi$$

(Note: $x \to -\infty$, $\phi \to \pi$ and $x \to \infty$, $\phi \to 0$)

$$= \frac{\mu_0 \lambda}{4\pi r} \left[\cos\phi \right]_{\pi}^{0}$$

$$\therefore \quad \boxed{B = \frac{\mu_0 \lambda}{2\pi r}}$$