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1.1 B from x_{dist} On axis of a current loop of radius a

$B = \frac{\mu_0 I a^2}{2({x_{dist}}^2 + a^2)^{3/2}}$

1.2 B on axis from magnetic dipole

$B = \frac{\mu_0}{2\pi} \frac{\mu}{x^3}$

1.3 Net Torque on closed loop with area A at orientation θ

$\tau = IAB\sin(\theta)$

1.4 Field outside, inside any current distribution with line symmetry

$B = \frac{\mu_0 I}{2\pi r}$

$B = \frac{\mu_0 I r_{inside}}{2\pi R^2_{outside}}$

1.5 Sheet with uniform current density J

1.6 Solenoid with turns n per unit length

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2.1 Flux through solenoid with n turns per unit length

$\phi_B = BA = \mu_0 n I \pi R^2$

2.2 Flux through rectangular loop with l parallel to wire at distance a

$\phi_B = \int B dA = \int_a^{a+w} \frac{\mu_0 I}{2\pi r} l dr = \frac{\mu_0 I l}{2\pi} \ln(\frac{a+w}{a})$

2.3 Induced current through circuit with bars at distance l and moving bar velocity v

$I = \frac{Blv}{r}$

2.4 Flux through coil with N turns turning at frequency f in field B

$\phi_B = NB\pi r^2 \cos(2\pi f t)$

$E = -\frac{d\phi_B}{dt}$

2.5 Inductance of a solenoid

$L = \frac{\phi_B}{I} = \mu_0 n^2 A l$

2.6 Electric field of a solenoid of radius R at loop radius r with $B = bt$

$E = \frac{R^2 b}{2r}$