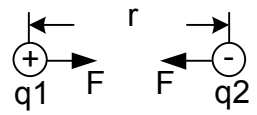
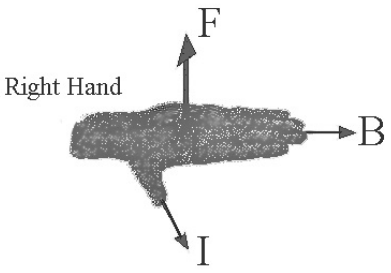
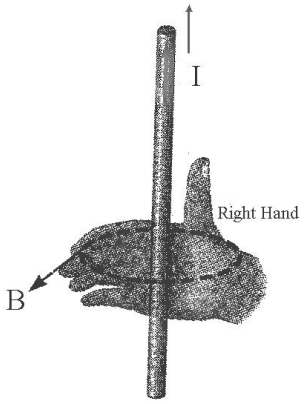
Formula Sheet (2nd Midterm)

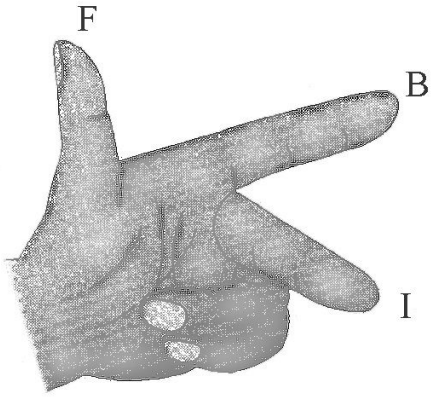
Formulas	Variables	Variables continued & Constants	Picture (Visualization)
example $F = \frac{kq_1q_2}{r^2}$	F : electric force q_1 : charge 1; q_2 : charge 2 r : separation distance	k : 8.99×10^9 Nm^2/C^2	
$EPE = q_0V = \frac{kq_0q}{r}$			
$\Delta(EPE) = -W_{AB} = -qE_x\Delta x$			
$V = \frac{kq}{r}$			
$V = Ed$			
$\frac{1}{2}mv_i^2 + EPE_i = \frac{1}{2}mv_f^2 + EPE_f$			
$Q = CV$			
$C = \frac{\kappa\varepsilon_0 A}{d}$			
$C_{eq} = C_1 + C_2 + \cdots$			
$\frac{1}{C_{eq}} = \frac{1}{C_1} + \frac{1}{C_2} + \cdots$			
$E = \frac{1}{2}QV$			
$I = \frac{\Delta Q}{\Delta t}$			
$I = nqv_dA$			
$V = IR$			
$R = \rho\frac{L}{A}$			

$\frac{R_1}{R_2} = \frac{I_2}{I_1}$			
$\rho = \rho_0[1+\alpha(T-T_0)]$; and $R = R_0[1+\alpha(T-T_0)]$			
$P = IV$			
$R_{eq} = R_1 + R_2 + \cdots$			
$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \cdots$			
$V_T = Emf - Ir$ and $I = \frac{Emf}{R_{total} + r}$			
$q = q_0[1-\exp(-t/(RC))]$			
$q = q_0 \exp(-t/(RC))$			
$F = q_0 vB\sin\theta$			
$F = IB\ell\sin\theta$			
$\tau = NIAB\sin\phi$			
$B = \frac{\mu_0 I}{2\pi r}$			
$B = N\frac{\mu_0 I}{2R}$			
$B = \mu_0 nI$			

Right- and Left-Hand Laws







*Label the above variables and explain briefly below.

Appendix

M (mega)	$\times 10^{6}$
k (kilo)	$\times 10^{3}$
m (milli)	$\times 10^{-3}$
μ (micro)	$\times 10^{-6}$