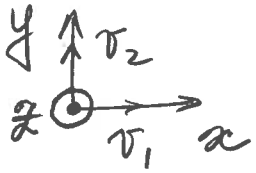
Test 3 2006

1. $i = \dfrac{V_1}{R_1 + R_3}$

$$Q = C\left(V_1 \frac{R_3}{R_1 + R_3} - V_2\right)$$

2. a) $F = 0$

b) 

$$F_y = q v_1 B$$
$$F_x = -q v_2 B$$
$$B = \frac{\mu_0}{2\pi} \frac{i}{r}$$

3. $\vec{B}_{tot} = \dfrac{\mu_0}{2\pi} \dfrac{i}{R}\left[\dfrac{2\pi - \theta}{2} + \tan\dfrac{\theta}{2}\right]\odot$

4. a) $\Phi = -\left(\alpha D + \beta \dfrac{D^2}{2}\right) H$

b) $L \dfrac{d^2Q}{dt^2} + \dfrac{Q}{C} = -C_1 H D$

c) $Q = -C C_1 H D$