Solution to Fin 533 Homework
Due Tuesday October 6, 2009

1.

$$\sigma_i = [\beta_i^2 \sigma_M^2 + \sigma^2(e_i)]^{1/2}$$
$$\sigma_A = [0.8^2 0.22^2 + 0.3^2]^{1/2} = 34.78\%$$
$$\sigma_B = [1.2^2 0.22^2 + 0.4^2]^{1/2} = 47.93\%$$

2.

$$E(r_p) = w_1 E(r_1) + w_2 E(r_2) + w_{rf}(r_{rf}) = .3(13\%) + .45(18\%) + .25(8\%) = 14\%$$
$$\beta_p = \sum w_i \beta_i = .3(0.8) + .45(1.2) + .25(0) = 0.78$$

Since the residuals are not correlated, then the variance of the residuals is:

$$\sigma(e_p)^2 = w_A{}^2 \sigma_A{}^2 + w_B{}^2 \sigma_B{}^2 + w_{rf}{}^2 \sigma_{rf}^2 = .3^2(.30)^2 + .45^2(.40)^2 + .25^2(0)^2$$
$$\sigma(e_p) = 20.12\%$$

$$\sigma_p^2 = \beta_p^2 \sigma_m^2 + \sigma^2(e_p) = 0.78^2(0.22)^2 + .2012$$
$$\sigma_p = 26.45\%$$

3. $E(R_j) = r_f + \left(E(r_M) - r_f\right)\beta_j = 8\% + (18\% - 8\%)1.25 = 20.5\%$

$$HPR = \frac{(P_1 - P_0) + D}{P_0} \qquad 20.5\% = \frac{(P_1 - \$100) + \$9}{\$100} \quad P_1 = \$111.50$$