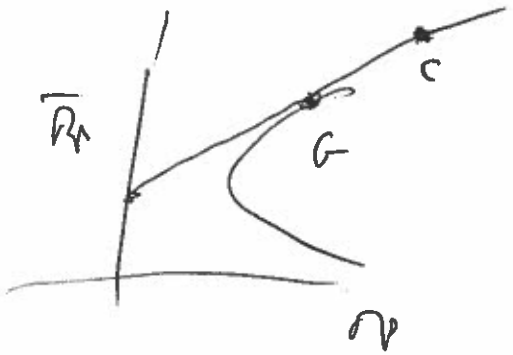
(3) (a) A: 0.30, B: 0.50, C: 0.20

$$\beta_P = \sum x_i \beta_i = 0.30(1.08) + 0.50(0.80) + 0.20(1.72)$$

$$\beta_P = 0.968$$



(b) $X = \frac{8}{5}$, $1 - X = -\frac{3}{5}$

PROPORTION IN PORTFOLIO G

$\bar{R}_G = 0.3\bar{R}_A + 0.50\bar{R}_B + 0.20\bar{R}_C = \dots$

$\bar{R}_C = \frac{8}{5}\bar{R}_G - \frac{3}{5}R_F = \dots$

$\sigma_G^2 = x_A^2\sigma_A^2 + x_B^2\sigma_B^2 + x_C^2\sigma_C^2 + 2x_Ax_B\sigma_{AB} + 2x_Ax_C\sigma_{AC} + 2x_Bx_C\sigma_{BC}$

$\Rightarrow \sigma_G = \sqrt{\dots}$

$\sigma_C^2 = \left(\frac{8}{5}\right)^2\sigma_G^2 + \frac{3^2}{5}\sigma_F^2 + 2\frac{8}{5}\frac{3}{5}\sigma_{GF}$

$\sigma_C = \frac{8}{5}\sigma_G$

WHERE:

$\bar{R}_A = \alpha_A + \beta_A\bar{R}_M$

$\sigma_A^2 = \beta_A^2\sigma_M^2 + \sigma_{\varepsilon A}^2$

$\sigma_{AB} = \beta_A\beta_B\sigma_M^2$

$\sigma_B^2 = \beta_B^2\sigma_M^2 + \sigma_{\varepsilon B}^2$

(c) $Cov(0.3R_A + 0.5R_B + 0.2R_C, R_M) = 0.3\sigma_{AM} + 0.5\sigma_{BM} + 0.2\sigma_{CM}$

$\sigma_{AM} = Cov(\alpha + \beta_A R_M + \varepsilon, R_M) = \beta_A\sigma_M^2$, $\sigma_{BM} = \beta_B\sigma_M^2$, $\sigma_{CM} = \beta_C\sigma_M^2$

$Cov(R_P, R_M) = \left[0.3(1.08) + 0.5(0.80) + 0.2(1.72)\right]0.002 = \beta_P\sigma_M^2$

$= 0.968(0.002)$

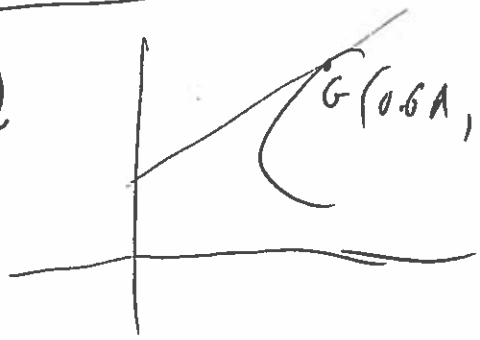
$= 0.001936$

$Cov(R_P, R_M) = \beta_P\sigma_M^2$

(7) (a) $\frac{1}{2}^2 0.16 + \frac{1}{2}^2 0.25 + 2\left(\frac{1}{2}\right)\left(\frac{1}{2}\right)\sigma_{AB} = 0.0521$

SOLVE FOR σ_{AB}

(b)



$\bar{R}_G = 0.6(0.14) + 0.4(0.10) = 0.124$

WE WANT

$x\bar{R}_G + (1-x)R_f = 0.11$

$x(0.124) + (1-x)0.05 = 0.11$

$x(.124 - 0.05) = 0.11 - 0.05$

$X = 0.06/0.074 = 0.81$

81% IN G

19% IN R_f

(c) @ $x(0.124) + (1-x)0.05 = 0.12$

$x = \frac{0.07}{0.074} = 0.68$

$1 - x = 0.32$

$0.68(0.6) = 0.408$

$0.68(0.4) = 0.272$

A: 40.8%

B: 27.2%

R_f: 32%

(d) $X_B = 1 = \frac{\sigma_A^2 - \sigma_{AB}}{\sigma_A^2 + \sigma_B^2 - 2\sigma_{AB}}$

$\Rightarrow 1 = \frac{\sigma_A^2 - \rho\sigma_A\sigma_B}{\sigma_A^2 + \sigma_B^2 - 2\rho\sigma_A\sigma_B}$ $\quad \rho = \frac{0.07}{0.06} = 1$

(e) $X_A = -0.33$, $\quad X_B = 1.33$