Econ 424 Lec 4

Note Title 10/12/2009

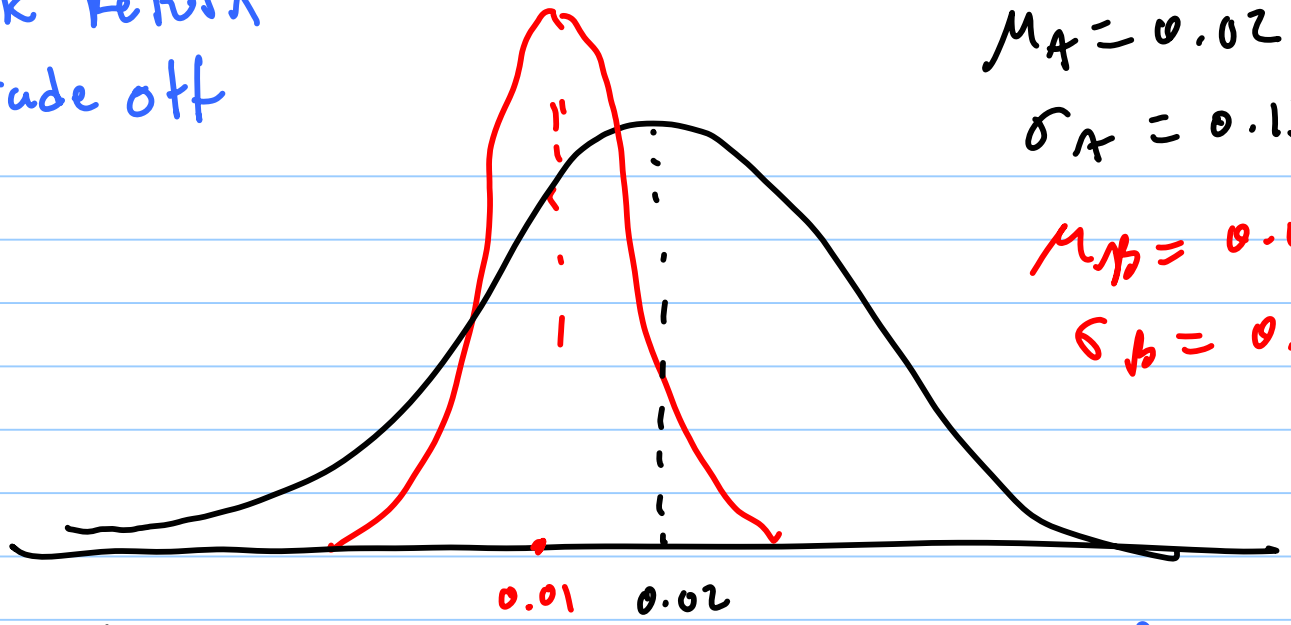
Topics

- Probability Review
  - Finish univariate random variables
  - Bivariate & Multivariate RVs

Announcement

- Friday at 11-12 held in CSSSCR small computer lab (SAV 121)

Ex: Risk Return trade off

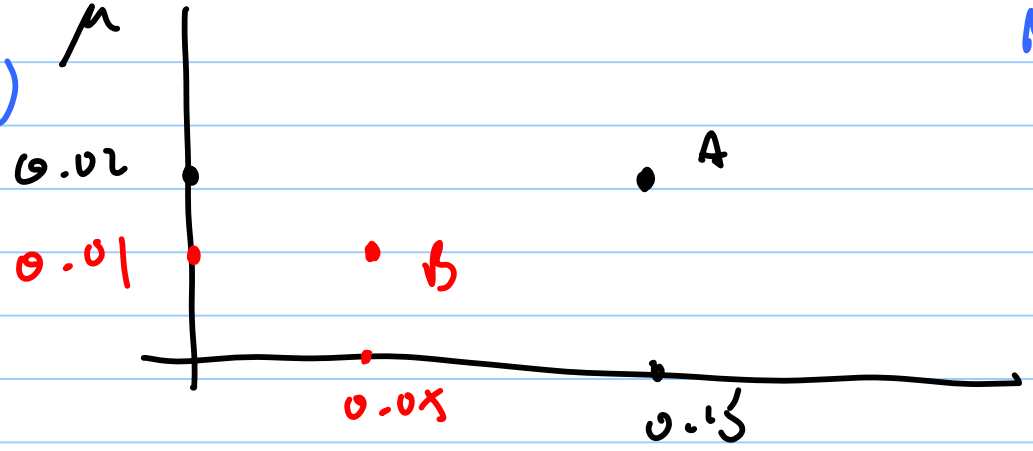


$\mu_A = 0.02$

$\sigma_A = 0.15$

$\mu_B = 0.01$

$\sigma_B = 0.05$

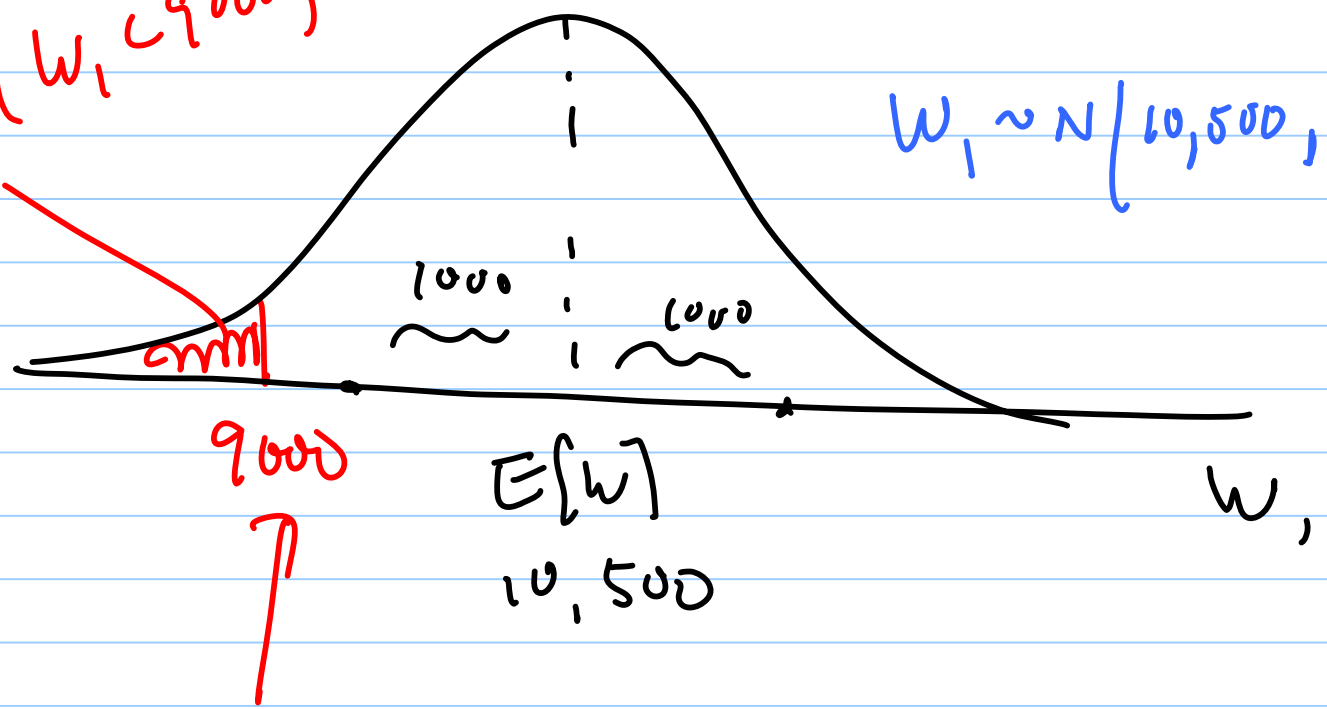


No free lunch: high expected return tends to come with high risk (SD)

Ex. VaR

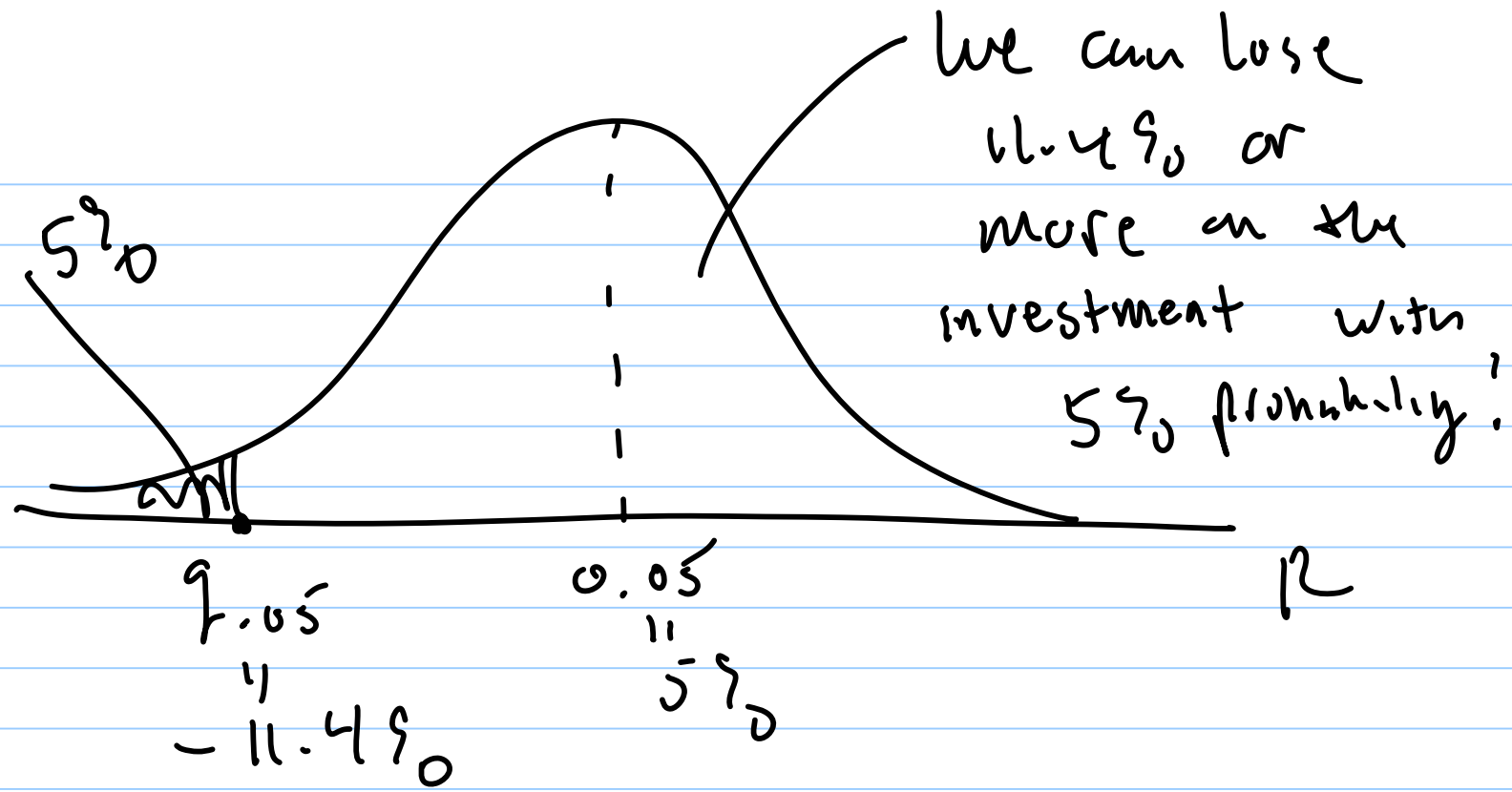
$W_1 = 1000 + 1000 \cdot R$

$W_1 \sim N(10{,}500, (1000)^2)$



6.7% quantile of W_1 distn

$= q^{W_1}_{.067}$



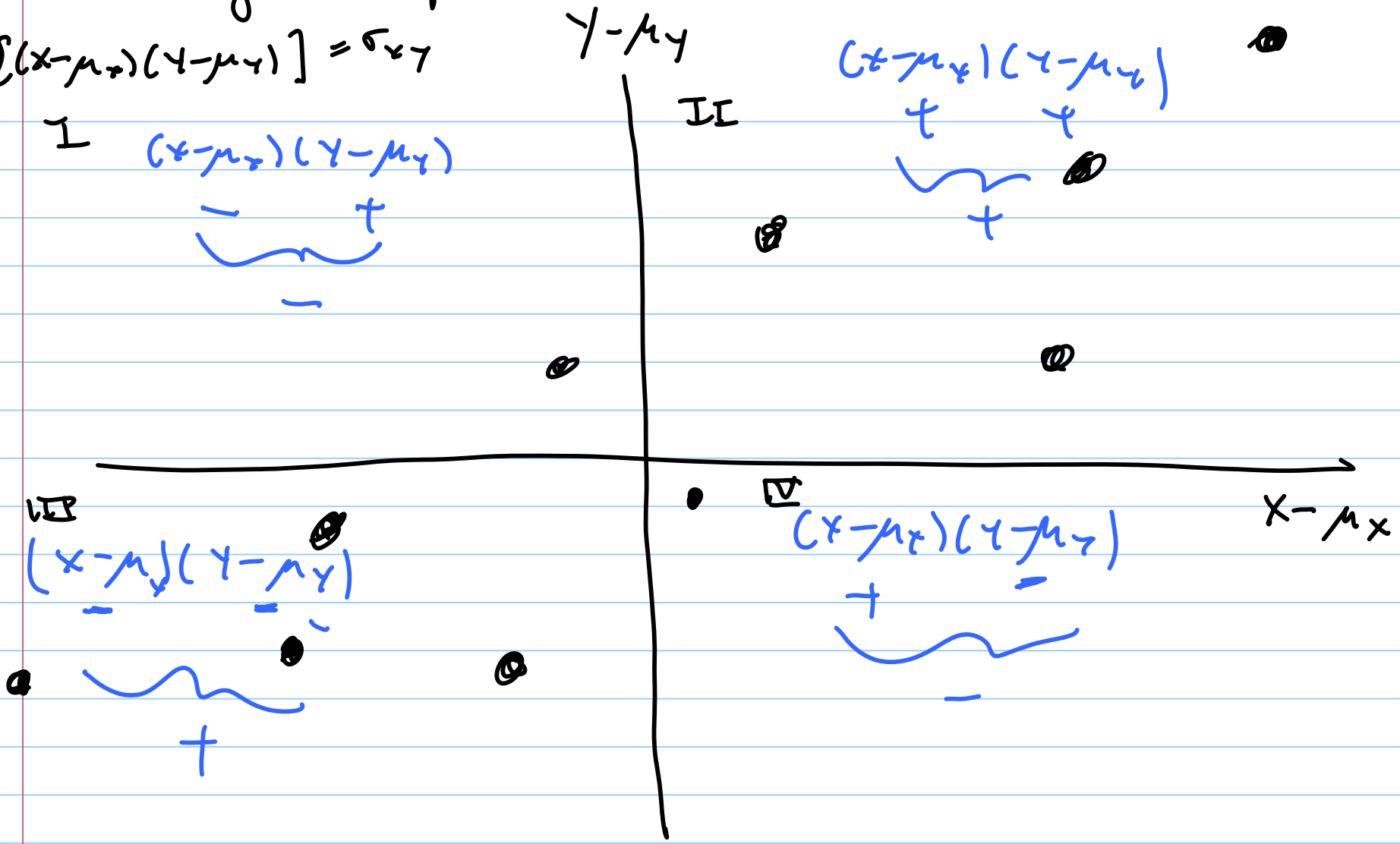
$$Pr(R \leq -11.4\%) = 5\%$$

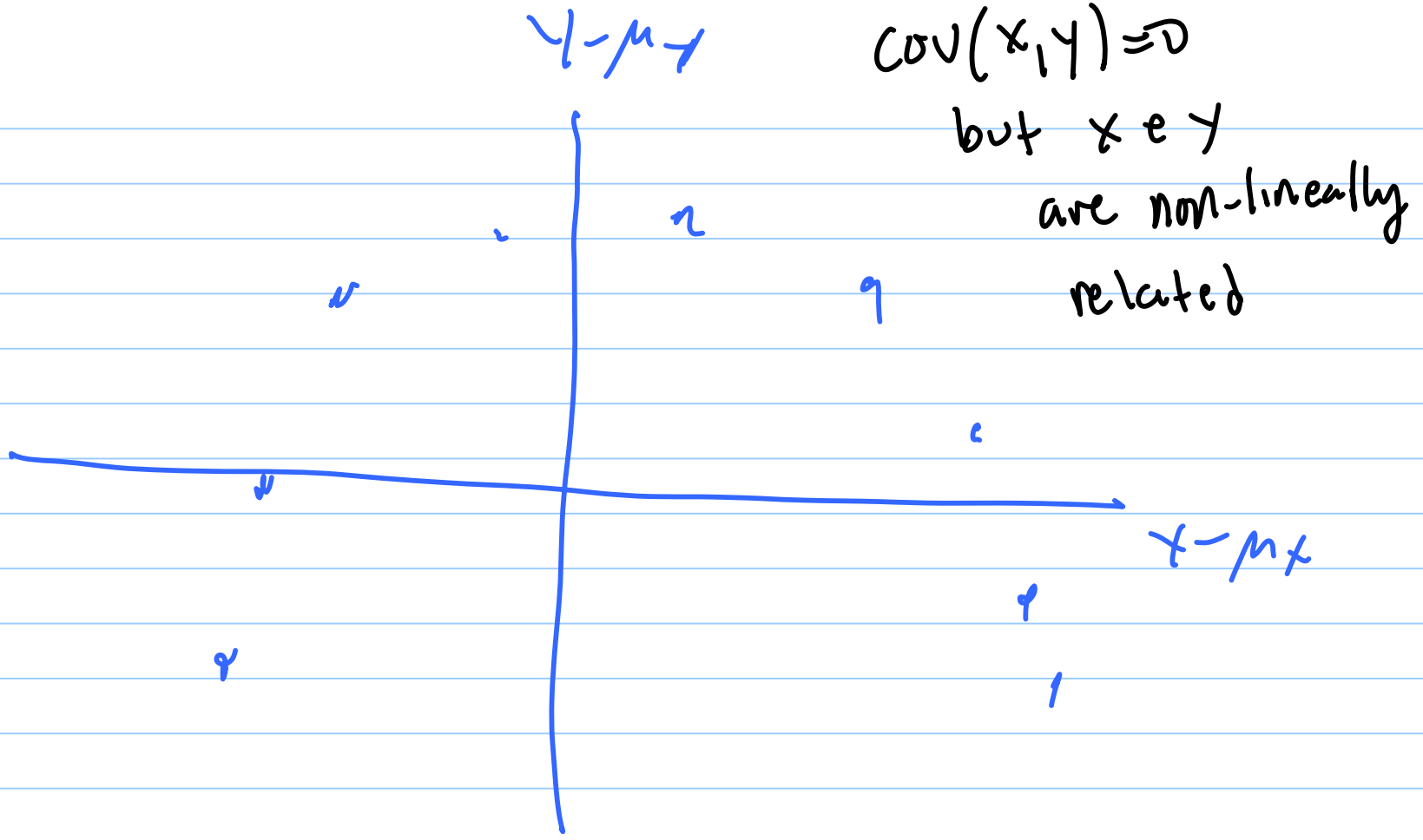
$$\Rightarrow VaR_{0.05} = W_0 \cdot r_{0.05} = (10{,}000)(-0.114) = -1140 \text{ \$}$$

Probability Scatterplot

$\sigma_{xy} > 0$

$E[(x-\mu_x)(y-\mu_y)] = \sigma_{xy}$





$cov(x,y)=0$

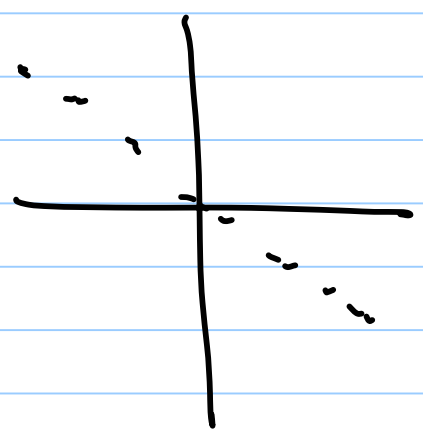
but x & y are non-linearly related

Example

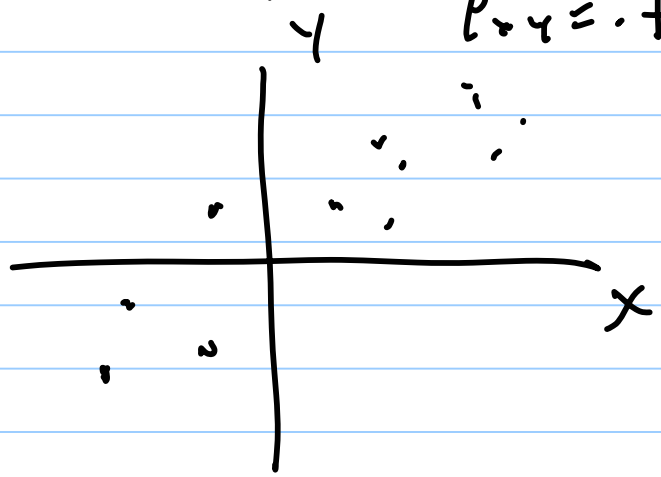
$\rho_{xy} = 0$

$\rho_{xy} = 1$

$\rho_{xy} = -1$



$\rho_{xy} = .7$



$\rho_{xy} = -.7$

$R^2 = \rho_{xy}^2$