Econometrics I, questions to solve in class

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- **Q1** : Let $Y = (1, 2, 3, 4)'$ and $X = (X_1, X_2)$, where $X_1 = (1, 1, 1, 1)$ and $X_2 = (1, -1, 1, -1)'$.

  - Find $(X'X)^{-1}(X'Y)$.
  - Why does it make sense not to write $(X'Y)(X'X)^{-1}$?

- **Q2** : Write down Y, X and compute $(X'Y), (X'X), (X'X)^{-1}$, and $\hat{\beta}$ for each of the following econometric models:

  - $Y_i \sim N(\beta, \sigma^2)$
  - $Y_i \sim N(\beta X_i, \sigma^2)$
  - $Y_i \sim N(\beta_0 + \beta X_i, \sigma^2)$