Quiz 3

Assume that

- $X_1, X_2, \ldots, X_n$ is a random sample from a normal population with mean μ_1 and variance σ_1^2.
- $Y_1, Y_2, \ldots, Y_n$ is a random sample from a normal population with mean μ_2 and variance σ_2^2.
- The X and Y samples are independent of each other.

(a) Compute (in terms of $\mu_1, \mu_2, \sigma_1, \sigma_2, n$)

- $E[\bar{X} - \bar{Y}]$
- $Var[\bar{X} - \bar{Y}]$ and $\sigma_{\bar{X}-\bar{Y}}$

(b) Assuming that $n = 25$, $\sigma_1 = \sigma_2 = 5$, $\bar{x} = 20$ and $\bar{y} = 10$, construct the 95% confidence interval for $\mu_1 - \mu_2$.