Math 3070 § 1.   **Third Quiz**   Name:_____

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This is an open book quiz. You are allowed to use your text, handouts
and notes. Other books, laptops, PDA's and text messaging devices are
prohibited. Calculators are permitted. Be sure to give complete
explanations to receive full credit. There are [30] total points.

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Linear Combinations. Two experiments are being run in which two different types of paints
are compared. Eighteen specimens are painted using Apple Red paint and the drying time in
hours is recorded for each. The same is done with twenty two specimens of Berry Blue paint.
The population mean and standard deviations are known to be $\mu_A = 23.91$, $\sigma_A = 1.11$ for Apple
Red and $\mu_B = 22.81$, $\sigma_B = 1.23$ for Berry Blue. Both drying times are known to be distributed
approximately normally. Let $\bar{X}_A$ and $\bar{X}_B$ be the sample means for each kind of paint.

1. [16] Find $\mu_{\bar{X}_A - \bar{X}_B}$ and $\sigma_{\bar{X}_A - \bar{X}_B}$.

2. [4] What assumptions are you making to answer (1)? What is the approximate distribution
   of $\bar{X}_A - \bar{X}_B$? Justify your answer.

3. [10] What is the probability that the sample mean drying time of Apple Red is an hour
   larger than the sample mean drying time for Berry Blue paint, $P(\bar{X}_A - \bar{X}_B > 1)$?

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