## Extra Credit Assignment

Name: $\qquad$
Math 1040-1
Due Friday, July 27, by 12:10 p.m.

Directions: Show all work for full credit. Clearly indicate all answers. Simplify all mathematical expressions completely. Give all approximate answers to three decimal places. Each question is worth 3 points. This assignment is worth a maximum of 15 points, which will be added to your highest midterm exam score.

1. Case studies showed that out of 10,351 convicts who escaped from U.S. prisons, only 7867 were recaptured. Find a $98 \%$ confidence interval for the proportion of escaped convicts who will eventually be recaptured and interpret your answer.
2. In the third week of July, a random sample of 40 farming regions gave a sample of mean $\bar{x}=\$ 8.12$ per 100 pounds of watermelon. Assume that $\sigma$ is known to be $\$ 1.97$ per 100 pounds. Find a $92 \%$ confidence interval for the population mean price (per 100 pounds) and interpret your answer.
3. A random sample of 5792 physicians in Colorado showed that 3139 provided at least some charity care (i.e., treated poor people at no cost). These data are based on information from State Health Care Data: Utilization, Spending, and Characteristics (American Medical Association). Find a $99.5 \%$ confidence interval for the proportion of physicians in Colorado that provide some charity care and interpret your answer.
4. For a hot air balloon in a state of equilibrium, 56 readings for the temperature for the air at the top of the balloon gave a mean temperature of $\bar{x}=98^{\circ} \mathrm{C}$. Assume that $\sigma=18^{\circ} \mathrm{C}$. Find a $95 \%$ confidence interval for the average temperature at the top of the balloon, and interpret your answer.
5. An auto insurance company took a random sample of 370 insurance claims paid out during a 1 -year period. The average amount paid for these 370 claims was $\$ 1870$. Assume that $\sigma=\$ 450$. Find a $92 \%$ confidence interval for the mean claim payment and interpret your answer.
