Stat 2470, Quiz #7, Spring 2014 Name KEY

Instructions: Show all work. You may use your calculator rather than compute formulas by hand, but if you do, 'show work' by saying which program you used to obtain the result and what information you entered. Round measures of center to one decimal place more than the data, and variance/standard deviation to two decimal places more than the original data. Round probabilities to three decimal places (or percent plus one decimal place).

1. Use your calculator to find the following probabilities using the normal distribution.
   a. $P(Z \geq 3.5)$ normalcdf(3.5, 599) = 2.3267×10^{-4}
   b. $P(-1.2 \leq Z \leq 1.8)$
   = .849

2. What x-value represents the 91st percentile of the distribution is normal with a mean of $\mu = 15.2$ and $\sigma = 2.41$.

invNorm(.91) = 1.340755...

$Z = \frac{X - 15.2}{2.41}$ $X = 1.34 \times 2.41 + 15.2 = 18.43$

OR

invNorm(.91, 15.2, 2.41) = 18.43

3. Suppose that the probability of an experienced editor finding a typo on a page of previously edited text is 0.02. While editing a particular text with 550 pages, the editor wants to know the probability of finding fewer than 5 errors. Can you use the normal approximation to the binomial in this instance? If so, explain why, and use the approximation to calculate the required probability. If not, explain why not, and use the exact value from the binomial distribution to compute the probability.

yes. $.02 \times 550 = 11 > 5$
$.98 \times 550 > 5$

normalcdf(-E99, 4.5, 11, 3.28)
= .0237559...

mean = np = 11
St.dev = $\sqrt{npq} = \sqrt{10.78} = 3.28329$