Psychology 225-004
Standard scores and Probability Practice Problems

1. An Interpersonal Reactivity Scale (IRS) was given to a population of juvenile sex offenders to measure their levels of empathy for victims. Assume that the IRS scores are normal with a mean of 7.66 and a standard deviation of 1.75

What is the probability of someone scoring a 9.02 or higher on the IRS?
a score of 9.02 corresponds to a z score of .78 Proportion in tail = .2177

50% of the offenders would score between *6.49 and 8.83*.
(*in a two tailed test the z scores corresponding with .25 in the tail is +/- .67)*

95% of the offenders would score between *4.23 and 11.09.*

2. In a population distribution with a mean of 1200 and a standard deviation of 150, what percentile corresponds to a score of 1425? *A score of 1425 corresponds with a z score of 1.5, therefore 1425 is in the 93rd percentile.* What score would someone have to get to score in the 45th percentile? *The 45th percentile corresponds with a z score of -.13; the score must be 1180.5.*

3. Applicants for a correctional facility are required to take a Doll-Chang Emotional IQ exam and only the top 20% will be accepted.

(a) If $\mu = 70$ and $\sigma = 11$, what score must an applicant get in order to be accepted? *If the tail proportion probability is .20, then the z score = .84 and the applicant must score 79.24.*
(b) If they decided to accept the top 40%, what score must an applicant get to be accepted? *If the tail probability is .40, the z score = .25 and the applicant must score 72.75.*
(c) If 80 applicants apply and they accept the top 40%, how many applicants are likely to be accepted? *40% of 80 = 32 applicants will be accepted.*

4. In a population with a mean of 500 and a standard deviation of 100, calculate the probability of someone scoring between:

a. 500 and 600 *z for 600 is 1 (.8413) z for 500 is 0 (.50) and .8413-.50 = .3413 is the proportion between 500 and 600*
b. 600 and 650 *z for 600 is 1 (.8413) z for 650 is 1.5 (.9332) and .9332-.8413 = .0919 is the proportion between 600 and 650*
c. 400 and 650 *z for 650 is 1.5 (.9332) z for 400 is 1(.1587) and .9332-.1587 = .7745 is the proportion between 650 and 400.*