MATH 3070 Introduction to Probability and Statistics **February 13, 2007**
Homework Assignment #1 **25 points**

1. The mean and standard deviation of the grades of 500 students who took an economics exam were 69 and 7, respectively.

   (a) What are the numerical values of the endpoints of the intervals $(\bar{x}-s, \bar{x}+s)$,$(\bar{x}-2s, \bar{x}+2s)$, and $(\bar{x}-3s, \bar{x}+3s)$?

   $69 \pm 7 = (62, 76)$
   $69 \pm 2(7) = (55, 83)$
   $69 \pm 3(7) = (48, 90)$

   (b) If the grades have a mound-shaped distribution, approximately how many students received a grade in each of the three intervals specified above?

   $0.68 * 500 = 340$ $\pm 1s$
   $0.95 * 500 = 475$ $\pm 2s$
   $0.997 * 500 = 498.5 \approx 499$ $\pm 3s$

2. Last year, the rates of return on the common stocks in a large portfolio had an approximately normal distribution, with a means of 20% and a standard deviation of 10%.

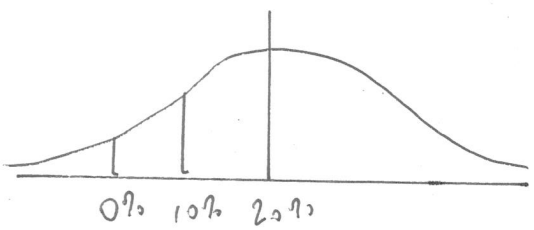
   (a) What proportion of the stocks had a return of between 10% and 30%?

   68 % why? $10\% = 20\% - 10\%$ $\mu - 1\sigma$
   $30\% = 20\% + 10\%$ $\mu + 1\sigma$

   (b) What proportion of the stocks had a return that was either less than 10% or more than 30%?

   32 % why? less than 10% or more than 30% is the area in the outer tails. 10% and 30% are $\pm 1\sigma$.

   (c) What proportion of the stocks had a positive return? (Hint: A normal-shaped distribution is symmetrical.)



97.5 %
50 % from 20% and above.
1/2 * 95% from 0% to 20%

$50 + 47.5 = 97.5\%$