Assignment:

1. Given independent random variables, X and Y, with means and standard deviations as shown in table, first identify if you are transforming a random variable, combining random variables, or both. Then, find the mean and standard deviation of each of these newly defined variables (in terms of X and Y).

	Mean	Stddev
X	80	12
Y	12	3

a) C = X – 20
b) H = 2X - 100
c) A = X + Y
d) R = X – Y
e) G = 0.5Y
f) E = .25X + Y
g) R = X – 5Y

2. Your track record of scores on English exams is normally distributed with a mean of 35 and standard deviation of 5. Your been informed if you attempt the homework (when assigned) and study prior to taking the exam, your score should double.
a) Is this situation a linear combination, transformation, or both?
b) Assuming you "do" as you are instructed, what would you expect your next English exam score to be?
c) Assuming you "do" as you are instructed, what is the standard deviation of your next English exam score?

3. **EGGS**. HEB believes that in a dozen eggs, the mean number of broken eggs is 0.6 with a standard deviation of 0.5 eggs. You buy 3 dozen eggs without checking them.
a) Is this situation a linear combination, transformation, or both?
b) How many broken eggs do you expect to get?
c) What's the standard deviation of broken eggs?
d) What assumptions did you have to make about the eggs in order to answer this question? Hint…it starts with the letter "I".

4. **MEDLEY**. In the 4X100 medley relay event, four swimmers swim 100 yards, each using a different stroke. CHS team preparing for the district championship looks at the times, their swimmer have posted, and creates a model based on the following assumptions:
• The swimmers' performances are independent.
• The means and standard deviations of the times (in seconds) are shown (in table).

Swimmer	Mean	Stddev.
1. Backstroke	50.72	0.24
2. Breaststroke	55.51	0.22
3. Butterfly	49.43	0.25
4. Freestyle	44.91	0.21

a) What are the mean and standard deviation for the relay team's total time in this event?

b) Assuming the team's time's distribution will be approximately normal with the mean and standard deviation as determined in part a, sketch and label a normal curve with center and standard deviation marked.
c) The team's best time so far this season is 3:19:48 (= 199.48 seconds). Do you think the team is likely to swim faster than this at the district championship? Explain.

5. On your drive (or ride) to school you have to pass through a total of 3 traffic lights. Assuming you stop when the light is red, the probability model of the number of stops needed and likelihood of number of red lights is shown in the table.

R=# of red lights	0	1	2	3
P(R = r)	.05	.20	.30	.45

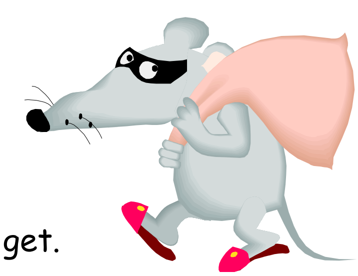
a) How many red lights should you expect to "hit" each day?

b) What's the standard deviation?

c) What is the expected number of red lights to hit on your way to school during a 5-day school week?

d) What's the standard deviation for this five day time span?

6. Thief! There are 12 batteries on Mrs. Backman's desk, unknowing to you 4 of the batteries are dead. You steal a random sample of 2 batteries for your Silver calculator.
a) Create a tree diagram representing the situation described.



b) Create a probability model for the number of good batteries you get.

G = # of good batteries			
P(G = g)			

c) What's the expected number of good ones you have stolen?

d) What's the standard deviation?