Case Study #5: Salary Plans

You have been hired as a senior operations manager in a large retail chain that sells various supplements and vitamins. The chain's CEO would like you to analyze two alternative salary plans for supervisors in a new company's store. The first plan would pay $35 an hour plus 5% commission on total daily sales above $15,000. The second plan would pay $40 an hour plus 2% commission on any daily sales above $15,000. Each supervisor will be working 8 hours a day.

In the store, daily sales highly depend on two parameters: number of customers buying in the store and how much they purchase. According to the existing records, it is known that the number of buying customers varies randomly from day to day; the following historical data describe the probabilities of the number of customers occurring in a day:

Number of Buying *Customers*	*Probability*
100-199	0.22
200-299	0.42
300-400	0.33
400+	0.03

In addition, the following historical data describe the probabilities of each amount of purchases occurring in a day:

Amount of Purchase, $	*Probability*
10 to 30	0.19
30+ to 50	0.23
50+ to 70	0.38
70+ to 90	0.16
90+	0.04

Questions.

1. Use a simulation model in Excel (without @Risk) to identify which plan is better in terms of the higher daily wage. Briefly explain your results.
2. Use a simulation model in Excel (with @Risk) to identify the better plan. Briefly explain your results, and compare the two plans results (without and with @Risk).
3. Consider the triangular distribution for the number of buying customers and normal distribution for the amount of purchase. The mean and standard deviation of the normal distribution for the amount of purchase should be equal to the mean (average) and standard deviation of the respective discrete probability distribution. Use a simulation model in Excel (with @Risk) with these distributions to identify the better plan. Explain your results and compare them with the results in question 1 and 2.