Homework Problem, Decision Analysis

You are manager of a city which has a problem with potholes in the city streets. The city council has instructed you to develop a recommendation for the best method of having the potholes repaired. The standard method of repairing potholes is certain to do the job successfully, and would cost the city $2,000,000. A new method for repairing potholes has been developed, and can be tried for $1,000,000. However, this method is not always successful, and the city engineer has advised the manager that the new method has about an 80% chance of working. If the new method did not work, the standard method would have to be used, for a total cost of $3,000,000.

1) What recommendation should the manager make to the city council, based on the expected monetary value criterion?

2) Assume that an additional option available is to conduct a study to acquire more information on the effectiveness of the new method when applied to conditions like those found in the city. The study would cost $200,000, and if the new method will work, the study has a 90% chance of correctly concluding that the new method would be effective. If the new method will not work, the study has a 30% chance of mistakenly concluding that the new method would be effective.

   a) What recommendation should the manager now make to the city council, based on the expected monetary value criterion?

   b) What is the most the manager should be willing to pay a consulting firm, based on the expected monetary value criterion?

3) What is the most the manager should be willing to pay a consulting firm for a study that would tell for sure whether the new method would work or not in the city? (That is, what is the expected value of perfect information?)