1. Four students invite seven people on a group date. The probability that any one of the seven people will show up is \( \frac{3}{4} \), independent of the others.

   a) What is the probability that more than four people show up (you can leave your answer in analytical form)?
   \[
   \binom{7}{3} \left( \frac{3}{4} \right)^3 \left( \frac{1}{4} \right)^2 + \binom{7}{4} \left( \frac{3}{4} \right)^4 \left( \frac{1}{4} \right)^1 + \binom{7}{5} \left( \frac{3}{4} \right)^5 \left( \frac{1}{4} \right)^0 = 0.7564
   \]

   b) If you know that two people will definitely come, what is the probability that more than four people show up (you can leave your answer in analytical form)?
   \[
   \binom{5}{3} \left( \frac{3}{4} \right)^3 \left( \frac{1}{4} \right)^2 + \binom{5}{4} \left( \frac{3}{4} \right)^4 \left( \frac{1}{4} \right)^1 + \binom{5}{5} \left( \frac{3}{4} \right)^5 \left( \frac{1}{4} \right)^0 = 0.8965
   \]

2. You are trying to pass a note across the classroom. You have two choices given a limited amount of paper and athletic ability:

   1) You can either make three copies of the note and throw each of them in succession (in which case each time you throw it you have a 1/5 chance of getting it to the targeted person). Each toss is independent of previous tosses.
   
   - or -

   2) You can hand a note sequentially to two people on the way to the targeted person (3 segments of the journey) with a segment success probability of 4/5. Each passing is independent of other passing.

   a) What is the probability of successfully sending the note by the throwing method?
   
   \[
   P(\text{success}) = 1 - (1 - \frac{1}{5})(1 - \frac{1}{5})(1 - \frac{1}{5}) = 1 - \frac{4}{5} \cdot \frac{4}{5} \cdot \frac{4}{5} = 1 - \frac{64}{125} = \frac{61}{125}
   \]

   b) What is the probability of successfully sending the note by the passing method?
   
   \[
   P(\text{success}) = \frac{4}{5} \cdot \frac{4}{5} \cdot \frac{4}{5} = \frac{64}{125}
   \]

   c) If you want to get your note to the targeted person, which, on average, would be the more successful method?

   Choose the one with the higher probability, so the passing method.