# MA 114-001 Test 4 

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Use your own paper to work the problems. Be sure to show your work.
When you finish, fold this paper lengthwise together with your work, so that this writing is on the outside. Write your name, row, and seat number above, and turn in.

1. A student thinks that the probability he will pass chemistry is $1 / 2$, the probability he will pass economics is $1 / 3$, and the probability he will pass both is $1 / 6$.
(a) What is the probability that the student passes neither?
(b) What is the probability that the student passes exactly one of the two courses?
2. Hillary, Jen and Kate are taking a class along with seven other students. (In all there are ten students in the class.) Three students from the class are chosen at random to attend a conference in New Orleans.
(a) What is the probability that Hillary, Jen and Kate are the three students chosen?
(b) What is the probability that Hillary is one of the students chosen?
(c) What is the probability that at least one of the three girls is chosen? (Hint: What is the probability none of the three girls is chosen?)
(d) What is the probability that Hillary and Jen are chosen, given that at least one of the three girls is chosen?
3. The Cardinals and the Blue Jays play a series of five baseball games. The Cardinals are the better team. They have a $2 / 3$ probability of winning each game.
(a) What is the probability that the Cardinals win exactly three of the five games?
(b) What is the probability that the Cardinals win at least three of the five games?
4. You are visiting Paris, and you want to find the Samaritaine department store. Here are some important facts:

- $30 \%$ of Parisians know how to find the Samaritaine department store. $70 \%$ do not.
- Of the Parisians who know how to find the Samaritaine department store, $80 \%$ will give you correct directions. The other $20 \%$ will not give you directions because they are too busy.
- Of the Parisians who do not know how to find the Samaritaine department store, $60 \%$ will admit that they do not know and will not give you directions. The other $40 \%$ will try to be helpful by giving you directions anyway, but their directions will be wrong.

You stop a Parisian on the street and ask for directions to the Samaritaine department store.
(a) Draw a tree that represents this situation.
(b) If the Parisian gives you directions, what is the probability that the directions are correct?
5. Julius is an $80 \%$ free throw shooter in basketball. He goes to the foul line to shoot a one-and-one. What is the expected number of points he will score? (Notes for people unfamiliar with basketball: Julius makes $80 \%$ of his free throws. His team gets one point for each free throw that he makes. In a one-on-one, Julius shoots one free throw. If he makes it, he gets to shoot a second free throw. If he misses his first shot, he does not get a second.)

