

2. (8 points) Of the three hundred consumers who bought a new Mazda3 at the Pacific Mazda car dealership last year, two hundred of them bought a sedan while the rest bought the hatchback. Fifty of the sedans had a standard transmission, while seventy-five of the hatchbacks did.

(a) Complete the contingency table below using the above information.

	standard	automatic
sedan		
hatchback		

(b) Calculate the probability that a random customer bought a hatchback with automatic transmission.

(c) Calculate the probability that if a random customer bought a hatchback, that it also had an automatic transmission.

(d) Calculate the probability that a random customer bought a hatchback or chose an automatic transmission or both.

3. (7 points) Three runners run a 100-metre sprint, and the order in which they finish is recorded. The runners' names are Ali, Bob, and Charles. Let's assume that all runners are equally qualified, so that all possible outcomes are equally likely.

For the following questions, please show enough work that I can see what method you are using.

(a) Write out the sample space for this situation.

(b) What is the probability that Ali wins the race?

(c) What is the probability that Ali comes first or second?

(d) Are "Ali coming first" and "Bob coming second" independent? Explain, including values of appropriate probabilities.

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4. (8 points) The mayor of Victoria was informed that household water usage is a normally distributed random variable with mean of 25 gallons/day and a standard deviation of 6 gallons/day.
- (a) If the mayor wants to give a tax rebate to the lowest 20% of water users, what should the gallons/day cutoff be?
- (b) Calculate the probability that a randomly-chosen household will use more than 27 gallons per day.