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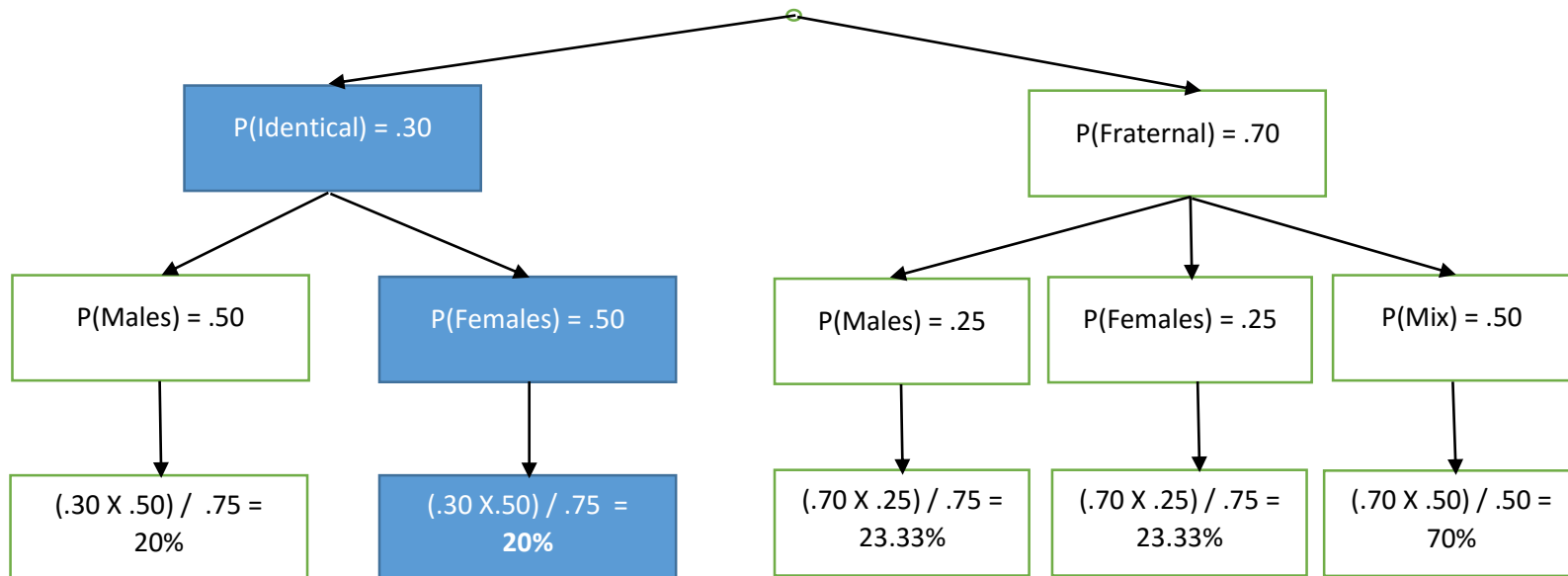
Presentation

IS606 Statistics and Probability

Problem 2.26

About 30% of human twins are identical, and the rest are fraternal. Identical twins are necessarily the same sex – half are males and the other half are females. One-quarter of fraternal twins are both males, one-quarter both female and one-half are mixes: one male and one female. You just became a parent of twins and are told that they are both girls. Given this information, what is the probability that they are identical?

$$P(A|B) = \frac{P(B|A) P(A)}{P(B)},$$



We can take the probabilities that are in the problem and create a tree for the different probabilities. Each case that is given in the problem, turns into another level on the tree. We start off with twins that can either be fraternal or identical. We then take each of those groups and break them apart into male, female or mixed. We can then multiply down each rung of the tree to get the conditional probability for each possible outcome. Then you divide by the population that you are asked for. You can then solve what the probability of any combination would be.

In this case, the probability of having identical twins given that they are both girls would be **20%**