

## **SECTION 8.3 : PROBABILITY TREES AND PROBABILITY WITH COMBINATIONS**

TREE DIAGRAMS are a useful tool in organizing and solving probability problems

Each complete path through the tree represents a separate mutually exclusive outcome in the sample space

1. Draw a tree representing the possible mutually exclusive outcomes
2. Assign conditional probabilities along the branches of the tree
3. Multiply probabilities along each complete path through the tree to find probabilities of each "AND" outcome in the sample space.
4. Add probabilities for the appropriate paths of a tree to find the probability of a compound OR event

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**EXAMPLE 11:** *From Chapter 3 Section 3.7 Tree diagrams in Illowsky, B., & Dean, S. Collaborative Statistics. Connexions, Dec. 5, 2008. <http://cnx.org/content/col11052/1.29>*

**An urn contains 11 marbles, 3 Yellow and 8 Blue. We randomly select 2 marbles from the urn.**

**Select 2 marbles WITH REPLACEMENT:**

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**Select 2 marbles WITHOUT REPLACEMENT**

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**FOR SELECTION WITHOUT REPLACEMENT**

(1) Use the tree to find the probability of getting one marble of each color

(2) Use combinations to find the probability of getting one marble of each color.