

*Course Book Examples and Problems.*

- 1) *Examples 9.1.1-9.1.5 and answers the Test Yourself Section. Book Page (523-524)*  
**Questions:** 12-14, 16-19, 21, 26, 28, 32
- 2) *Examples 9.2.2-9.2.12 and answers the Test Yourself Section. Book Page (536-539)*  
**Questions:** 1, 3-4, 6, 8-9, 11, 14-16, 18-21, 27, 29-31, 35.
- 3) *Examples 9.3.3-9.3.4, 9.3.6-9.3.7 and answers the Test Yourself Section. Book Page (549-553). Questions:* 4, 6, 8, 9-11, 14-16, 19-22, 28, 30-32, 38-39, 48-49.
- 4) *Examples 9.5.1-9.5.13 and answers the Test Yourself Section. Book Page (581-58).*  
**Questions:** 1, 3, 6, 8, 15, 17, 19, 23, 28, 29.
- 5) *Read section 9.6-9.8 in detail.*

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**Question 1:** A biased coin has 60% chance of landing on heads. If it is thrown three times, then find the probability of getting

- 1): Three heads.
- 2): Two heads and a tail
- 3): At least one head.

Also draw the complete probability tree.

**Question 2:** There is a bag filled with **2 blue, 8 red and 2 yellow balls**. Stas picks a ball out of the bag, notes its **color and replaces it**. He then takes another ball from the bag.

What is the probability of:

- 1): getting 2 reds
- 2): getting 2 blues
- 3): getting 2 yellows
- 4): getting 2 different colors

Draw the complete probability tree.

**Question 3:** There is a bag filled with 2 blue, 8 red and 2 yellow balls. Stas picks a ball out of the bag, notes its **color and does not replaces it**. He then takes another ball from the bag.

What is the probability of:

- 1): getting 2 reds
- 2): getting 2 blues
- 3): getting 2 yellows
- 4): getting 2 different colors

Draw the Complete Probability Tree.

**Question 4\*:** A couple decided to have 4 children. What is the probability that they will have at least two boys? Provide your own approach to solving this problem, reference researches and relevant datasets.

**Question 5:** Inclusion/Exclusion

Let's we have 150 students which likes to drink 3 different juices A, B and C.

Let 58 students drink A, 49 student's drinks B, 57 drinks C, 14 drinks A and C, 13 drinks A and B, 17 drinks B and C, 4 drinks A, B and C. Find how many drinks none?

**Question 6:** Permutation and Combinations.

Suppose there are 1000 students total in a school, and 650 are taking English, 550 are taking math, 500 are taking science, 350 are taking English and Math, 250 are taking English and Science, 300 are taking Math and Science. Now, if every student is taking at least one of the three, how many students are taking all three?

**Question 7:** The probability of a car repair being on time is 0.40. The probability of a car repair being satisfactory is 0.50. The probability that a car repair is neither satisfactory not on time is 0.25. What is the probability of a repair being satisfactory and on time?

**Question 8:** Five letters are to be selected from the letters in the word "ADVANTAGE". How many different combinations are there that will contain letter A?

**Question 9:** Suppose that four cards are taken at random without replacement from a pack of cards. What is the probability that two kings and two queens are chosen?