



Applications to Probability

Year 11
Mathematical Methods

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Learning Objectives

By the end of the lesson, I hope that you understand and can apply the following to a range of questions from the Year 11 Mathematical Methods course.

- Understand how to apply the Permutation and Combination theory to a range of probability problems.



RECAP

In the past two lessons we have looked at the ideas of arranging items where an order is important, and order is NOT important. We can use permutation and combinations theory to assist with this.

We can now apply this to the subject area of probability.



Example 1

Four-letter 'words' are to be made by arranging letters of the word SPECIAL. What is the probability that the 'word' will start with a vowel?

$$\underline{3} \quad \underline{6} \quad \underline{5} \quad \underline{4} = \underline{\underline{360}}$$

$$\underline{7} \quad \underline{6} \quad \underline{5} \quad \underline{4} = \underline{\underline{840}}$$

$$\therefore P_r = \frac{360}{840} = \underline{\underline{\frac{3}{7}}}$$

7.

$$P_r = \frac{\text{num of succ}}{\text{num of trials}}$$



Example 2

Three students are to be chosen to represent the class in a debate. If the class consists of six boys and four girls, what is the probability that the team will contain:

a exactly one girl

b at least two girls?

$${}^4C_1 \times {}^6C_2 = 4 \times 15 \\ = 60$$

$$\therefore a. \Pr = \frac{60}{120} = \frac{1}{2}$$

$$b. \quad {}^4C_2 \times {}^6C_1 + {}^4C_3 \times {}^6C_0 \\ = 6 \times 6 + 4 \times 1 \\ = 36 + 4 = 40$$

3.

6B 4G

$${}^{10}C_3 = 120$$

2G 1B
1G

3G

$$\therefore \Pr = \frac{40}{120} = \frac{1}{3}$$



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Questions to complete

The following are the minimum number of questions you are expected to answer. There is nothing wrong with answering more!

Ex10D

Questions: TBA



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