

$$(x-1)(x-3) = 0$$
$$x = 1, 3$$

# PROBABILITY

MATHS

LEVEL 2

## Strategy Guide

This paper tests your ability to read! All of the questions are based on context, and use skills which are applicable to the real world. This means that you have to be able to interpret given information, and pick out the information in it that is important in answering the questions. The good news is, despite varying contexts, the assessed skills are the same every year - so practicing under different circumstances definitely helps!

### OVERVIEW OF THE STANDARD

- Probability trees
- Two-way tables
- Normal distribution
- Evaluating claims (including expected values/risk and relative risk)

### STRUCTURE OF THE EXAM

*Warning: this section is to help you focus your time/study. Our analysis is based off previous year's exams and is no substitute for understanding the concepts. NCEA can change the exam format without much notice, so the best strategy is to be prepared for anything!*

The exam is likely to be broken into 3 questions. Each of these questions will have a large number of parts to them - that assess different ways of using each core skill. There is usually one question using probability trees, one that assesses normal distribution and a third that asks you to evaluate a claim using the concepts of risk and relative risk. Expect two-way tables and proportions to pop up throughout the exam.

### CONCEPTS AND SKILLS TO FOCUS ON

Although every aspect of the exam is equally important, here are some key concepts to focus your study on:

#### **Drawing probability trees, and understanding how each branch relates to the others:**

Although it sometimes isn't compulsory to draw a probability tree, creating one based on the information you are given in a question helps to break it down, and understand what you are calculating. On top of this, understanding that you multiply probabilities down a branch, and can add branches together gives you clear ways of relating probabilities to each other.

### Understanding standard deviation, and how it relates to the normal distribution graph:

Standard deviation has a confusing name, a tricky symbol, and is overall a bit of a funny one to get your head around. However, understanding standard deviation is critical to answering questions related to normal distribution. In order to make sure you understand it fully, think about how standard deviation relates to the normal distribution graph.

### Assessing claims using evidence:

The exam will ask you to explain whether claims from a specific source are accurate or valid. Although the phrasing seems more like an English exam, the examiner wants to see mathematical evidence to back up your words. Make sure you are comfortable integrating mathematical evidence, such as risk calculations, with a written explanation regarding the validity of claims.

### COMMON MISTAKES:

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From the NCEA gods themselves:

#### Adding probabilities down a probability tree branch:

Probability trees are a great tool to use in your exam - but only when they are implemented correctly! It is easy to lose marks by forgetting that you multiply (not add or divide) the numbers as you move down a branch.

#### Giving probability values greater than one:

One of the key characteristics of a probability, is that it never exceeds one. If your answer is greater than one, it is a good sign that you have calculated something incorrectly. Remembering that a probability of one means an event is certain to occur also helps to answer other proportion questions.

#### Not distinguishing between Z values and probabilities:

This is a very common mistake! It is important that you know the difference between a Z value and a final probability - and understand that the Z value is just part of the process to finding the probability of an event occurring. Therefore, just giving the Z value does not count as a correct answer.

#### Not using statistical terms correctly:

The probability paper involves lots of terms used to describe data - such as mean, median and range. It is important that you understand these terms, and how they differ from each other. You can pick up marks when you use them correctly - but will quickly lose the marker's confidence when you use the wrong ones.

### OVERALL STUDY AND EXAM STRATEGY:

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The probability paper involves more reading and writing than the other level two maths papers. Because of this, it is important that you take your time when answering questions, and allow yourself to spend time interpreting the questions and information correctly. Take time to plan your answers - and think about the strategy you are going to use to find values and justify claims before you jump in.

