

MTH4108 Probability I – 2009/10

Some Terminology

Mathematical statements are given a range of different names. Here we list a few of them.

Firstly, we need to talk about the mathematical world we are studying. To do this we have *definitions* which are precise explanations of terms.

Hopefully we can then establish some results. Mathematicians give their results a variety of names. A *theorem* is an important result. A *lemma* is a less important result, often used as a stepping-stone to proving a theorem. A *proposition* is a usually a result with a conceptually simple proof. A *corollary* is a result that follows at once from a previously established result. The distinction between theorems, lemmas and propositions is often rather arbitrary. Theorems, lemmas and propositions all need proofs. A *proof* is a logical argument which demonstrates that the result is necessarily true. It is not sufficient, for example, just to check that the result is true for a few cases. We will discuss proof more during the course and in other courses.

You will also see *examples* and *remarks*. These have the same meaning as in everyday language.

Finally, mathematics is a living subject which thrives on problems being posed. We have *conjectures* which are statements which the author believes to be true but is unable to prove (it may be that a conjecture subsequently turns out to be false and there is no shame in this). If the author is not sufficiently confident to predict whether a statement is true or false it may be asked as an *open question*.