A SAMPLE PAPER

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Introduction

Every math paper has an introduction that tells what the paper is about. It doesn't contain any proofs.

1. Theorems and such things

In your expositions, please be aware of the meanings of words. For example, an *equation* is a pair of expressions separated by an equal sign, and one may ask whether an equation is true or false, or for which values of the variables it holds. An example of an equation is $ax^2 + bx + c = 0$. A *symbol* is usually a single letter. Examples of symbols are x and c. If you use symbols as abbreviated notation for something else, then it's a good idea to define them before using them. An *expression* is something (without an equal sign) which represents a mathematical entity, often a number. An example of an expression is $b^2 - 4ac$ or x^{n+1}. A *formula* is an equation that provides a solution to another equation. An example of a formula is

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a},$$

which provides a solution to the quadratic equation above. One *proves* a statement and one *constructs* a geometric figure. A *term* is a member of a sum, and a *factor* is a member of a product. Be careful not to start a sentence with a mathematical symbol, variable, or number.

A *theorem* is an important true statement that the reader may want to use or refer to. Theorem 1.1 below is an example.

A *lemma* is a mathematical fact worth presenting separately that plays a role in the proof of a later theorem. It's usually not deemed to be of independent interest to the reader.

A *proposition* is intermediate between a lemma and a theorem. Perhaps it is useful in proving a theorem, and also of some independent interest.

Theorems, lemmas, and propositions, should come with proofs.

Theorem 1.1. *If $x = 1$, then $x + x = 2$.*

Proof. We compute as follows: $x + x = 1 + 1 = 2$. □

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2. Citations

Some papers might even include references to the literature, such as [2] or [1, Theorem 1]. The bibliographic information, in *bibtex* format, can be downloaded from MathSciNet at http://e-math.ams.org/mathscinet/ and placed into a separate file we'll call `sample.bib` for processing by `bibtex`.

You probably won't need this in most of the papers for our class.

References

1. Wolfgang Krull, *Jacobsonsches Radikal und Hilbertscher Nullstellensatz*, Proceedings of the International Congress of Mathematicians, Cambridge, Mass., 1950, vol. 2 (Providence, R. I.), Amer. Math. Soc., 1952, pp. 56–64. MR 13,526c
2. Oscar Zariski, *A new proof of Hilbert's Nullstellensatz*, Bull. Amer. Math. Soc. **53** (1947), 362–368. MR 8,499g

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