

Exploring Hyperbolic Geometry Using Mathematica

1. INTRODUCTION

These notes provide a brief introduction to the use of *Mathematica* on the computers in Kidder 108, and should also work anywhere on campus where *Mathematica* is installed.

2. GETTING STARTED

- Browse to `\\poole\ClassFolders\Math-Dray` .
- Copy `PoincareLab.nb` to your ONID filespace.
- Double-click (your copy of) `PoincareLab.nb` and work through the examples.

To execute a command, hold down the shift key while pressing enter.

You may need to open sections in order to see the commands they contain. To do so, double-click on the bracket near the right edge of the screen which spans the section you want to open.

You need to select a command before executing it, either by clicking anywhere in the text, or by single-clicking the bracket at the right. (By default, *Mathematica* expects you to type a new command, rather than jumping to the next command.)

3. USING MATHEMATICA

You can assign names to variables simply by using an equals sign. For instance, `pi=3` would assign the value 3 to the variable named `pi`. (This is not the name *Mathematica* uses for π , which is called instead `Pi`). *Mathematica* commands typically take the form `Command[argument]` . Note the capitalization of the command name, and the use of square brackets. Some commands take multiple arguments, separated by commas. Vectors are given in curly brackets, such as `v={x,y}` , which defines *v* to be the vector (x,y).

4. STARTING MATHEMATICA

There are several ways to start *Mathematica*. The easiest is:

- Double-click on the `MathStart` notebook in `\\poole\ClassFolders\Math-Dray` .

You may wish to save a copy of the `MathStart` notebook in your ONID account.

This will open a *Mathematica* notebook, containing one “initialization” command.

The initialization command will execute automatically the first time you execute any command; you do not need to execute it separately.

You can also start *Mathematica* by double-clicking on the shortcut on the desktop and/or in `\\poole\ClassFolders\Math-Dray` . However, in this case you will have to tell *Mathematica* how to find my files — which was done automatically by the initialization command referred to above.

To load a file from `\\poole\ClassFolders\Math-Dray` , you can always enter the full path, for example `<<\\poole\ClassFolders\Math-Dray\Poincare.m` .

Alternatively, you can tell *Mathematica* once and for all to search my files by entering the command

```
$Path = Join[$Path, {"\\poole\ClassFolders\Math-Dray"}]
```

after which you can load my files simply by entering commands like `<<Poincare.m` .