

MPS115/MPS116: LAB 3 EXPERIMENTS

A. STUDENT

1. TYPESETTING PRACTICE

- (1) The formula for the addition of velocities in relativistic mechanics is

$$f(u, v) = \frac{u + v}{1 + \frac{uv}{c^2}}.$$

- (2) TeXmaker makes it easy to find Greek letters and to typeset things like

$$\Xi^{\Phi\Omega} = \frac{\theta}{\gamma}.$$

- (3) Pointing and clicking in TeXmaker also helps with things like the following:

$$\underbrace{\circ \dots \circ}_{n \text{ times}}.$$

- (4) Typically we use $\mathbb{R}$ to denote the real numbers and $\mathbb{C}$ to denote the complex numbers.

2. THE SQUARE-ROOT OF 2

We are going to investigate a solution of the equation

(1)
$$x^2 = 2.$$

Definition 2.1. The positive solution to equation (1) is denoted $\sqrt{2}$.

Lemma 2.2. *Any rational number can be written in the form a/b with a and b coprime integers.*

Proof. Suppose that we have a rational number p/q where p and q are integers with $q \neq 0$. Blah blah blah. $\square$

Theorem 2.3. *The real number $\sqrt{2}$ is irrational.*

Proof. We prove this by contradiction. First we assume that $\sqrt{2}$ is rational and so can be written as a/b for *coprime* integers a and b . Blah blah blah. $\square$