

MAS115: WEEK 3 EXPERIMENTS

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) Overleaf has a list of symbols, making it easy to typeset things like

$$\Xi^{\Psi\Omega} = \frac{\theta}{\gamma} \iff \chi = v(\rho).$$

- (3) As you learn more commands, even things like the below become easy.

$$\underbrace{\partial \dots \partial}_{n \text{ times}}$$

2. THE SQUARE-ROOT OF 2

Here, we're going to investigate a solution of the equation

$$x^2 = 2. \tag{1}$$

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 $\frac{a}{b}$, where a and b are coprime integers.

Proof. Cancel if necessary. □

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

Proof. This is a famous proof by contradiction. □