

## ATTEMPT AT LAB 2

A. STUDENT

### 1. RESEARCH IN MATHEMATICS AND STATISTICS

The following information was taken almost word-for-word from the websites in the References section.

**1.1. Pure Mathematics.** The *Pure Mathematics Cluster* at the University of Sheffield carries out cutting-edge research in Algebra, Algebraic Geometry, Mathematical Physics, Number Theory, and Topology, providing a dynamic environment for study and research.

**1.2. Applied Mathematics and Theoretical Physics.** The *Applied Mathematics and Theoretical Physics cluster* brings together researchers using mathematics to model the key physical processes affecting our planet, our star and our universe. We have particular expertise in the following areas:

- Gravitation and Cosmology;
- Plasma Dynamics;
- Fluid Mechanics;
- Solar Physics.

### 1.3. References.

- <https://sheffield.ac.uk/mps/research/maths/pure-math>
- <https://sheffield.ac.uk/mps/research/maths/applied-mathematics>

### 2. TYPESETTING PRACTICE

(1)  $x^2 + y^2$ ;  $x_i$ ;  $x_i^2 - y_i^2$ ;  $x_{im}$ ;  $x_i^m$ ;  $x^{2p}$ .

(2)  $\frac{1}{y}$ ;  $\frac{x^2}{x+y}$ ;

$$\frac{\frac{1}{x} + \frac{1}{y}}{\frac{1}{x+y}}.$$

(3)  $\sqrt{x+y} + 7$ ;  $\sqrt[3]{7}$ ;  $\sqrt[n]{1 + \sqrt{1+x}}$ .

(4)

$$\int_0^\infty e^{-x^2} dx = \frac{\sqrt{\pi}}{2}; \quad \sum_{i=1}^n i = \frac{1}{2}n(n+1).$$

(5)  $\sin^2 x + \cos^2 x = 1$ ;

$$\Gamma(x) \equiv \lim_{x \rightarrow 0} \prod_{v=0}^{n-1} \frac{n! n^{x-1}}{x+v}.$$

(6)  $(2^{2^{2^2}} - 1)^2$ ;  $\{\alpha + (\sqrt{\beta} + \gamma^2)^2\}$ .

(7)  $\sum_{i=1}^n i^2 = \frac{1}{6}n(n+1)(2n+1)$  for  $n = 1, 2, 3, \dots$