Setup

1. Create an account on `www.overleaf.com`
2. Choose a template.
3. Copy paste the Preamble in this TeX document into the left hand screen of `overleaf`
4. Ask me if you have questions.
5. Use Google if you want to find out how to do X, Y, Z (someone has already asked your question, believe me!)

LaTeXcommands

To input basic text you need to type.

You can make text **bold**, *italicized* (v.1), *italicised* (v.2) or SMALL CAPS. You can also type in `typewriter type`.

You can make text large, larger, largest, largestest, largestestest, small, smaller or tiny.

You can take away an indent add horizontal space

or vertical space.

Text can also be colourful and centered (but you need to ensure you include the appropriate package).

Mathematics:

You can include sequences (a_n) in text, or as displayed math

$$(a_n)$$

You can also write limits $\lim_{n\to\infty} a_n$ in text, and general symbols Σ, ∞, α, π, Π.

Fractions are $\frac{easy}{to}$ write $\frac{2}{3}$ or $\frac{\pi}{2}$, or

$$\frac{2345}{3456}, \quad \frac{2\cdot 3\cdot \cdots \cdot 5}{3.4\cdot 7\cdot \cdots 8}$$

And we can write nice integrals $\int_0^1 f(x)dx$ in text, or displayed

$$\int_a^b \int_c^d \sqrt{4-x^2}dx = \frac{d}{dz}\int \sqrt{4+x^2}\frac{dx}{dt}$$

Example Template

Let (b_n) be a sequence of nonzero real numbers.

1. The m^{th} **partial product associated to** (b_n) is

$$p_m = b_1 b_2 \cdots b_m.$$

2. The **sequence of partial products associated to** (b_n) is the sequence (p_m), where p_m is the m^{th} partial product associated to (b_n).

3. If the sequence (p_m) of partial products associated to (b_n) is convergent and $L = \lim_{m\to\infty} p_m \neq 0$, then we say that

$$\prod_{n=1}^{\infty} b_n = L = \lim_{m\to\infty} p_m.$$

We call $\prod_{n=1}^{\infty} b_n$ an **infinite product**. In this case, we say the infinite product $\prod_{n=1}^{\infty} b_n$ **converges**; otherwise, the infinite product **diverges**. In particular, if $\lim p_m = 0$ then the infinite product diverges.

Example:

1. Let $b_n = \frac{n}{n+1} = 1 + \frac{1}{n}$. Then,

$$b_1 = \frac{1}{2},\ b_2 = \frac{2}{3},\ b_3 = \frac{3}{4}, \ldots$$

The partial products associated to (b_n) are

$$p_1 = b_1 = \frac{1}{2},\ p_2 = b_1 b_2 = \frac{1}{3},\ p_3 = b_1 b_2 b_3 = \frac{1}{4}, \ldots$$

In general,

$$p_m = b_1 b_2 \cdots b_m = \frac{1}{2} \cdot \frac{2}{3} \cdot \frac{3}{4} \cdots \frac{m-1}{m} \cdot \frac{m}{m+1} = \frac{1}{m+1}$$

Hence, $\lim_{m\to\infty} p_m = 0$ and the infinite product diverges.