MAA 4211 Homework 5 [or whatever number]

Your name here

August 16, 2021

Sample start of book problem:

<u>Abbott, Exercise 3.2.5</u>

Let $F \subseteq \mathbf{R}$. First assume that F is closed. Then ...

[Optionally, you may write out the problem before your answer. Having the problem written down on your handed-in work will make it easier for you to use your homework as a study-aid later.]

Sample start of non-book problem:

<u>B1</u>. (a) ...

Sample definition:

Definition 1 Let X and Y be sets. The *union* of X and Y, denoted $X \cup Y$, is the set $\{z : z \in X \text{ or } z \in Y\}$.

Sample proposition, with example of emphasized word, and sample proof:

Proposition 2 *For each $n \in \mathbf{N}$, let $f_n : [0, 1] \to \mathbf{R}$ be the function defined by $f_n(x) = x^2 + \frac{x}{n}$. Prove that the sequence $(f_n)_{n=1}^{\infty}$ converges uniformly.*

Proof: Define $f : [0, 1] \to \mathbf{R}$ by $f(x) = x^2$. Let $\epsilon > 0$ be given. Let N be any integer greater than $\frac{1}{\epsilon}$. Then for each $x \in [0, 1]$ and any $n \geq N$ we have

$$
\begin{aligned}
|f_n(x) - f(x)| &= \frac{x}{n} \\
&\leq \frac{1}{n} \\
&\leq \frac{1}{N} \\
&\leq \epsilon.
\end{aligned}
$$

Hence (f_n) converges uniformly (to f). ∎

Here is an illustration of the "eqnarray" environment, with a "nonumber" command on the top line:

$$
\begin{aligned}
\zeta(2) &= \sum_{n=1}^{\infty} \frac{1}{n^2} \\
&= \frac{\pi^2}{6} \, . \tag{1}
\end{aligned}
$$

Some other useful LaTeX commands not illustrated above:

3

$$\int_a^b f(x)\,dx$$

$$\lim_{n\to\infty} b_n$$

$$\|x\|$$

$$\dots$$

$$A \setminus B$$

$$\tilde{A}$$

$\widetilde{A}$ (using my command "Tilde" instead of "tilde")

$$\bar{W}$$

$\overline{W}$ (using my command "Bar" instead of "bar")

$$\mathbf{W}$$

$$\mathcal{W}$$

```
W
```

W

There is a website "detexify" that provides a convenient way to search for LaTeX commands that produce math symbols. You can also

search using Google, etc., if you know the name of the symbol you're looking for.

Above (in the source file) are two examples of inserting vertical space (using the "bigskip" command and the "vspace" command). In the "vspace" command I used, "in" stands for "inches". You can insert space between the number and "in"; LaTeX doesn't care. The actual amount of space inserted may not be what you told LaTeX to insert; for that, you'd use "truein" instead of "in". But usually, you just play around with different-size spaces till you find one that looks the way you want, without worrying whether it's exactly the number of inches you told LaTeX to insert.

This is a page of text with the margins and spacing produced by this template file (an example of acceptable margins and spacing for something you're handing in to me for grading). You may wish to print it out and keep it next to you when you're writing.

The quick brown fox jumped over the lazy dog. The quick brown fox jumped over the lazy dog. The quick brown fox jumped over the lazy dog. The quick brown fox jumped over the lazy dog. The quick brown fox jumped over the lazy dog. The quick brown fox jumped over the lazy dog. The quick brown fox jumped over the lazy dog.

All work and no play makes Jack a dull boy. All work and no play makes Jack a dull boy. All work and no play makes Jack a dull boy. All work and no play makes Jack a dull boy. All work and no play makes Jack a dull boy. All work and no play makes Jack a dull boy.

Where did I put that axe? Where did I put that axe? Where did I put that axe? Where did I put that axe? Where did I put that axe? Where did I put that axe? Where did I put that axe? Where did I put that axe? Where did I put that axe? Where did I put that axe? Where did I put that axe?