LaTex Help by Example

The "LaTex Help by Example" items will help you LaTexing your homework. If you have to do something similar when your LaTexing your homework, just compare the Example LaTex code to the complied output.

How to write a proof.

Basically, we start our proof with \begin{proof} and end our proof with \begin{proof}. Then just put our proof between the \begin{proof} and \end{proof}. Recall, as soon as we write \begin{proof}, in order to compile we need to include the \end{proof} below the \begin{proof}, In LaTex, whenever we *being* something, we need to *end* that something before compiling. The below example is a slight modification to the proof of Theorem 1.8 on page 21.

Theorem 1.8. If x and y are odd integers, then $x \cdot y$ is an odd integer.

Proof. Let x and y be odd integers. We will prove that $x \cdot y$ is an odd integer.

Since x and y are odd integers, there exist $m \in \mathbb{Z}$ and $n \in \mathbb{Z}$ such that

$$x = 2m + 1 \text{ and } y = 2n + 1. \tag{1}$$

By (1) and simple algebra,

$$\begin{aligned} x \cdot y &= (2m + 1)(2n + 1) \\ &= 4mn + 2m + 2n + 1 \\ &= 2(2mn + m + n) + 1 \\ &= 2q + 1 \end{aligned}$$

where $q = 2mn + m + n$. Since the integers are closed under addititon, $q \in \mathbb{Z}$. We have just shown

$$x \cdot y = 2q + 1 \text{ for some } q \in \mathbb{Z}. \tag{2}$$

Thus equation (2) shows that $x \cdot y$ is an odd integer by the defintion of odd integer.

We have just shown that if x and y are odd integers, then $x \cdot y$ is an odd integer. ■