In the preamble to your latex document, be sure to indicate that we'll be using the AMS theorem package (the AMS is the American Mathematical Society):

```
\usepackage{amsthm}
\newtheorem{mytheorem}{Theorem}
\newtheorem{mydef}{Definition}
```

This is the Section Heading

This is the introduction, where you set up the definitions and the notation for the remaining part. Using the first name in the braces (after `newtheorem`), we can write definitions and theorems. Here are two examples.

Definition 1. *The derivative of $y = f(x)$ at $x = a$ is defined to be*

$$f'(x) = \lim_{x \to a} \frac{f(a+h) - f(a)}{h}$$

if the limit exists.

Now in the text, I can refer to Definition 1. I can also refer to the theorem I have listed as well, see Theorem 1.

Theorem 1. *(The Extreme Value Theorem) Let f be continuous on the closed interval $[a, b]$. Then f attains a global maximum and a global minimum on $[a, b]$.*

And here is how to include a proof:

Proof. Here is the proof of my theorem. □

The proof environment sets off the beginning with *Proof:* and the ending with a Q.E.D. block. Here is a numbered equation, and I reference Equation 1 this way.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \tag{1}$$