ICCS200: Assignment homework-number-here

Write your name here!
write-your-email-address@where.com
Recitation: Your recitation section
The date

1: Mathematical Symbols

This is an example of an answer to a homework question. In your answer, you may want to use a variety of mathematical symbols:

- Fractions: $\frac{2}{3}$
- Binomial coefficients: $\binom{n}{k} = 10$
- Subscripts and superscripts: t_0, t^2, $t_0^{2/3}$,
- Greek letters: α, β, γ, λ, Π, π.
- Summations: $\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$.

You can refer to Leslie Lamport's "LaTeX User's Guide and Reference Manual" for more useful info on mathematical typesetting with LaTeX. Pages 42-46 outline many of the useful math symbols and functions.

Another good reference is Adam Blank's excellent LaTeX guide. Find it on the Web at `http://www.countablethoughts.com/documents/HowToLaTeX.pdf`

2: Little Gauss's Formula

This is another example of a question. In this case, it's a multi-part question.

(a) Recall *Little Gauss's formula*:

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2} \tag{1}$$

(b) Now, equation 1 can be proven by induction as follows:

- **Base case**: $n = 1$: $1 = 1(2)/2 = 1$.
- **Inductive hypothesis**: assume the equation holds for $n = 2...k$.
- **Inductive step**: for $n = k + 1$, we have

$$\sum_{i=1}^{k+1} i = (k+1) + \sum_{i=1}^{k} i$$

Using the inductive hypothesis, we can substitute for the second term on the righthand side:

$$\begin{aligned}\sum_{i=1}^{k+1} i &= (k+1) + k(k+1)/2 \\ &= \frac{2k+2+k(k+1)}{2} \\ &= \frac{k^2+3k+2}{2} \\ &= \frac{(k+1)(k+2)}{2}\end{aligned}$$

Lo and behold! The last line shows that for $n = k + 1$, little Gauss' formula still holds for $n = k + 1$! We've showed that the formula holds for $n = 1$, and we've shown that if it holds for $n = k$ it must hold for $n = k + 1$. Therefore, it must hold for all n.