LATEX EXAMPLE

YOUR NAME

1. Question 1

Each homework answer should be a section. Do not rearrange the order in which you answer homework questions (i.e. answer question 2 first, then question 3, and answer question 1 last). That will just make things confusing.

This is Section 1. Note how the source code uses the label and ref commands. Latex is very easy to use once you get used to it. You can either type it in a text file or use an editor.

This is a new paragraph because of the preceding blank line. This text is *italic*, **bold**, underlined. You can have `monospace text` that is code for code.

```
You can
also have
larger
blocks like that using the verbatim environment
```

This is a bulleted list:

- first item
- second item
- You must have at least one item or this will not compile

This is a numbered list:

(1) first
(2) second

2. Inline Math

You can have math within text like this: $1^{32} + x_{var}^4 7 = 3$, we also have symbols $=, \leq, \geq, <, >$. This is a set: $\{1, 2, 3\}$. Within text, math needs to be enclosed in dollar signs.

This is a vector $\vec{x}$. This is a dot product $\vec{x} \cdot \vec{y}$. This is a fraction $\frac{1}{2}$. We can make other dots: $\ldots$ and $\cdots$ and $\vdots$

3. Separate equations

We now prove $(1 + 1) + 1 = 3$. Add two backslashes to start a new line in the equations:

$$\begin{aligned} (1+1)+1 &= (2)+1 && \text{(this is known)} \\ &= 2+1 && \text{note how the ampersand symbol aligns things} \\ &= 3 \end{aligned}$$

Check out how text within equations was added in the previous lines.

We can do the same with equation numbering (we use align instead of align*):

$$\begin{aligned} (1+1)+1 &= (2)+1 && (improperly added text) \\ &= 2+1 \\ &= 3 \end{aligned} \tag{1}$$

We assigned a number to Equation 1.

4. Other useful patterns

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$$x = \sum_{i=1}^{n} y_i \prod_{j=1}^{32} \beta_j$$

$$z = \begin{cases} 1 & \text{if } a < b \\ 2 & \text{otherwise} \end{cases}$$

$$y = \arg\min_{\alpha} \frac{1+\alpha}{\alpha + \log(\alpha) + \sin(\alpha)}$$

$q = \left(3^8\right) * \left[6_4^8\right]$ left and right rescale parentheses

$$R = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{pmatrix}$$

$$a \leq \int_0^{\infty} \frac{df(x)}{dx} \frac{\partial g(y,z)}{\partial z} \, dy$$

$s =$ spaces in math mode:| | | |.