Latex Certificate Course Instructions

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Instructions

1. Open day07.tex using Verbtex
   (a) Download Daily Course Material and Assignment Instructions for Day 7 (day07.tex, asg07.pdf) from Google Classroom.
   (b) Open Internal storage/Android/data/verbosus.verbtex/files/Local/Latex Course/ Folder using File Manger Application.
   (c) Delete all files in ../Latex Course/ Folder.
   (d) Copy day07.tex file into Internal storage/Android/data/verbosus.verbtex/files/Local/Latex Course/ Folder.
   (e) Open Verbtex Application.
2. Exercise
   (a)
3. Upload day07.tex, and Latex Course.pdf files into Google Classroom as your response to the assignment.

1 LaTeX Concepts

1.1 Mathematics Fonts

- Blackboard Letters : `$\mathbb{R}$` produces $\mathbb{R}$
  For example : $\mathbb{R}$, real field.
- Caligraphic Letters : `$\mathcal{R}$` produces $\mathcal{R}$
  For example : $\mathcal{T}$ be a topology on X.
- Ralph Smith's Letters : `$\mathscr{R}$` produces $\mathscr{R}$
  For example : Let $\mathscr{A}$ be a Borel algebra on subset of A.
- Fraktur Letters : `$\mathfrak{R}$` produces $\mathfrak{R}$
  For example : Let $\mathfrak{S}$ be a complex function.

1.2 Special Commands

- `$\sqrt[5]{11}$` produces $\sqrt[5]{11}$
- `$\frac{12}{34}$` produces $\frac{12}{34}$
  For example : $\frac{x^2+1}{x+1}$
- `$\binom{n}{r}$` produces $\binom{n}{r}$
  For example : $\binom{n}{r} = \frac{n!}{r!(n-r)!}$
- `$\pmod{n}$` produces $\pmod{n}$
  For example : $17 \cong 4 \pmod{13}$
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1.3 Commands and Arguments

- The values on which Commands work are called arguments.
  For example : In `$\sqrt{11}$`, 11 is an argument of the Command \sqrt
- Some Commands also accepts optional arguments. Optional arguments are always given in '[ ]' brackets.
  For example : In `$\sqrt[5]{11}$`, 5 is an optional argument of the Command \sqrt
- Some Commands take multiple arguments.
  For example : The \frac Command requires two arguments.

1.4 Display Mode

- A pair of '$ $'s are used to print mathematics in between lines of text.
  For example : Let $x \in X$ and ... produces Let $x \in X$ and ...
- '$$ $$' or '\[\]' is used to print mathematics expressions which take more than usual text height.
  For example : `\[ \lim_{h \to 0} \frac{f(c+h)-f(c)}{h} = f(c) \]`

$$\lim_{h \to 0} \frac{f(c+h)-f(c)}{h} = f(c)$$

1.5 Equation Environment

- `\begin{equation} ...\end{equation}`
  For example : `\begin{equation}e^i\pi + 1 = 0 \end{equation}`

$$e^i\pi + 1 = 0 \tag{1}$$

- Equations are automatically numbered.

- \notag Command is used to skip numbering.
  For example : `\begin{equation} (\cos \theta + i \sin \theta)^n = \cos n\theta + i \sin n\theta \notag \end{equation}`

$$(\cos\theta + i\sin\theta)^n = \cos n\theta + i\sin n\theta$$

1.6 Matrix Environment

- \begin{bmatrix} ... \end{bmatrix}
  For example : `\[ \begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{bmatrix} \]`

$$\begin{bmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & \cdots & a_{mn} \end{bmatrix}$$

- Matrix environments are available only in Math mode.
- Five different matrix environments : bmatrix, Bmatrix, pmatrix, vmatrix and Vmatrix are available.
  For example :

$$\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \quad \begin{Bmatrix} 1 & 2 \\ 3 & 4 \end{Bmatrix} \quad \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \quad \begin{vmatrix} 1 & 2 \\ 3 & 4 \end{vmatrix} \quad \begin{Vmatrix} 1 & 2 \\ 3 & 4 \end{Vmatrix}$$

Bonus Material

- Try printing $df = \frac{\partial f}{\partial x}dx + \frac{\partial f}{\partial y}dy$ using \partial, \frac Commands.