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Course Code 123: Assignment n

This .tex LaTeX file is the learning version, prepared by Kat Matheson.
Any questions should be directed to `g3.matheson@gmail.com`

If you lost the template, simply delete everything below the comment *%%delete-me* and save your own.
Make sure to keep the \end{document} line, though or it might go on forever.

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1 LaTeX

LaTeX has odd spacing.
if you write a line and continue on the next one, you might notice a problem
if you write a line and something else
and continue on the next one, you might notice it's fixed, sort of?
what if... hmmmmm
now?
how about now?
where are my spaces?
i guess i only need one...

i could do this though

i can write in the middle

or over here to write my name and student ID in the top right corner

this is normal text, **but this is bolded.**
this is normal text, *this is italicized*, and *this is emphasized*

this is normal text, `and this is cool math-ish pc-looking text`
this is large this is Large or you can be small or even tiny

over here
weeeeeeeeeeeeeeee

weeeeeeeee

eeeeeeee

2 Math

a,b,c,d,e,f,g,h,i,j,k,l,m,n,o,p,q,r,s,t,u,v,w,x,y,z
1,2,3,4,5,6,7,8,9,0
$a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z$
$1, 2, 3, 4, 5, 6, 7, 8, 9, 0$

$$a, b, c = 1, 2, 3 = \sum_{i=1}^{j} \int_{0}^{\infty} e^{ix} \, dx$$

`greek letters for variables`
$\alpha, \beta, \gamma, \sigma, \theta, \epsilon, \varepsilon$

`math symbols`
$\sum_{i=1}^{n}, \prod_{i=1}^{n}, \bigcap_{i=1}^{n}, \bigcup_{i=1}^{n}$
$a + b,\ a - b,\ a \pm b$
$\frac{a}{b}, a/b$
$a > b, a \geq b, a < b, a \leq b$
$a \neq b, a \sim b, a \approx b, a \simeq b$
$a \cdot b, a \times b, a * b$
$a^b, a^{2b}, a^2 b$
$a_b, a_{2b}, a_2 b$
$A \cup B, A \cap B, A \setminus B$
$A \subset B, A \subseteq B, A \supset B, A \supseteq B$
$\in, \notin$
$\forall,\ \exists,\ \implies,\ \impliedby,\ \iff$
$a \wedge b, a \vee b$
$\mathbb{P}(a + b) < \mathbb{E}(c \pm d)$
$x \in \mathbb{N}, y \in \mathbb{R}, z \notin Z, \alpha \in \mathbb{Q} \setminus (\mathbb{N} \cap \mathbb{Q}^c)$
and so on $\cdots$
and so on $\ldots$

`math functions`
$\sin(x), \cos^2(x), \tan(\theta)$
$e^{x_i^2}, \log_2(x)$

$$f'' = f^{(2)} = \frac{d^2 f}{dx^2} \neq \frac{\partial^2 f}{\partial x \partial y}$$

`math auto-sizing brackets`
$(2 + 2)$
$\left[\left(2 + \frac{1}{2}\right)\right]$
$\left\{((2 + 2)) > \bigcap_{i=1}^{n} \frac{\sum_{i=1}^{n} (i+1)^2}{\theta_1}\right\}$

$$\left(1 + \bigcap_{i=1}^{n} \frac{\sum_{i=1}^{n} (i + 1)^2}{\theta_1}\right)$$

`math comments`

$$a = b \text{ because science}$$

$$andd = e \text{ because}$$

$$b = c \qquad \text{according to my mom}$$

$$\begin{aligned} x &= y \\ &\sim \theta - 3 \text{ and some other text} \\ &= z + 1 \quad \text{and some other text} \\ &< z + 3 \qquad \text{and some other text} \end{aligned}$$

$$\begin{aligned} x &= 2 \qquad & i &= 1 \\ x &= 3 \qquad & i &= 2 \end{aligned}$$

`matrices`

$$\begin{bmatrix} 0, 1, 2 \\ 3, 4, 5 \\ 6, 7, 8 \end{bmatrix} \begin{pmatrix} 0, 1, 2 \\ 3, 4, 5 \\ 6, 7, 8 \end{pmatrix}$$

`cases`

$$f(x) = \begin{cases} \frac{1}{2} & \text{if } x > 0 \\ \theta_0 & \text{if } x = 0 \\ 0 & \text{otherwise} \end{cases}$$

Examples

common mistakes were made on purpose, to show what they do, and why certain things are useful

(1) $\sum_{i=0,i\neq k}^{n-1} x_i^2$

(2)

$$\sum_{i=0,i\neq k}^{n-1} x_i^2$$

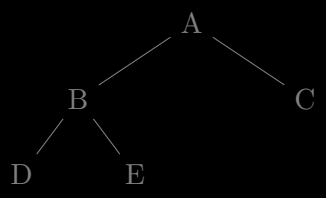
(3) $\sum_{i=1}^{n} \frac{x_i+y_i}{2^{i^{i-1}}}$

(4) $\prod_{i=1}^{n} \left(\frac{x_i+y_i}{2^i}\right)^{i-1}$

(5) $\frac{\sum_{i=1}^{n} x_i}{n}$

(6) $\frac{\int_0^1 \frac{a}{x^{-2}}\ dx}{2}$

3 Algorithms

4 Trees

more on drawing trees (here) (this is a hyperlink, it will open the default browser from a pdf click)
see the .tex file for how to draw the tree