

Practice test

Put your name here

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On the test day you will be handed a print out of typeset file (in pdf) similar to the following and will be asked to reproduce it as closely as you can using L^AT_EX. You will have access to a Latex reference table.

1 Reproduce each of the following as closely as you can

1. The equation $x^2 + y^2 = 1$ describes a unit circle.

2. Integration.

(a) $\int f(x) dx$ denotes an **antiderivative** of $f(x)$. (The backslash-semicolon produces space in math mode.)

(b) $\int_a^b f(x) dx$ is a *definite integral*. Note that this can also be written as $\int_a^b f(x) dx$; the latter is an “inline” mathematical formula. (Look carefully at how the quotation marks are produced.)

3. Fractions, sub- and super-scripts, and square root.

$$f'(x) = \sqrt{\frac{x_{ij} - 5}{y^{ab_n}}}$$

4. $\lim_{x \rightarrow 0^+} \ln(x) = -\infty$.

5. $\forall n \geq 0, \exists m > \max(2, n)$ such that $\sin(m\pi/n) = 0$.

6. If $f : A \rightarrow B$ is one-to-one, then $a \in A \Rightarrow f(a) \in B$; and $a \neq a' \Rightarrow f(a) \neq f(a')$. But $\alpha < \beta \not\Rightarrow f(\alpha) < f(\beta)$.

7. Notice the different types of ellipses: $1 + 2 + \dots + n$ vs. $1, 2, \dots, n$.

8. (a) Here's a matrix: $A = \begin{bmatrix} a + 5b & 2 & 3 \\ 0 & -1 & -c \end{bmatrix}$

(b) Here's a piecewise function. Let $f(x) = \begin{cases} 2x & \text{if } |x| \leq 2 \\ \sum_{i=1}^{100} x \Delta x & \text{if } x < -2 \text{ or } x > 2 \end{cases}$