My First LaTeX Document

(Your Name Here)

April 25, 2015

(Your Photo Here)

1 Introduction

1.1 About Me

Use this paragraph to introduce yourself. You may wish to talk about your background (where you grew up, places you've traveled, your family, pets, etc.) or you could share some interesting facts about yourself or experiences you've had.

1.2 Interests & Hobbies

- **Thing 1** Describe an interest or hobby.
- **Thing 2** Describe an interest or hobby.
  - Include a bulleted list at least two levels deep (this is a second-level bullet).
    - This is a third-level bullet.
    - This is a third-level bullet.
  - This is a second-level bullet.
    - This is a third-level bullet.
    - This is a third-level bullet.

1.3 Favorite Quotations

1. *Your favorite quote here. - Author*
2. *Another favorite quote here. - Author*

2 Mathematics

2.1 Mathematics and Me

Reflect upon your experiences with mathematics. What do you like about mathematics? How far (if at all) would you like to take your study of mathematics? What have you enjoyed learning this year in mathematics? What have you found the most challenging?

2.2 Mathematical Notation

Choose a four-digit number which you will use to practice typesetting mathematical expressions. Typeset **everything below, including all text** just as you see it, substituting your four-digit number in place of the sample number 1972 wherever it occurs (use appropriate values when simplifying the equation in 4(b)).

1. Superscripts, subscripts, and Greek letters
   (a) 19^{72}
   (b) $1^{9^{7^2}}$
   (c) 19_{72}
   (d) $1_{9_{7_2}}$
   (e) 1972π
   (f) $\cos\theta$
   (g) $\tan^{-1}(1.972)$
   (h) $\log_{19} 72$
   (i) $\ln 1972$
   (j) $e^{1.972}$
   (k) $0 < x \leq 1972$
   (l) $y \geq 1972$
2. Roots, fractions, and displaystyle
   (a) $\sqrt{1972}$
   (b) $\sqrt[19]{72}$
   (c) normal: $\frac{19}{72}$ displaystyle: $\displaystyle\frac{19}{72}$
   (d) normal: $\frac{1}{9+\frac{7}{2}}$ displaystyle: $\displaystyle\frac{1}{9+\frac{7}{2}}$
   (e) normal: $\sqrt{\frac{19}{72}}$ displaystyle: $\displaystyle\sqrt{\frac{19}{72}}$
3. Delimiters
   (a) display math mode:
   $$\left(1+\frac{9}{72}\right)$$
   (b) display math mode:
   $$\left|\frac{1}{9}-\frac{7}{2}\right|$$

4. Tables and equation arrays

(a)

x	1	2	3	4
$f(x)$	1	9	7	2

(b)

$$\begin{aligned} 1+9-7*2 &= x && (1)\\ 1+9-14 &= x && (2)\\ 10-14 &= x && (3)\\ x &= -4 && (4) \end{aligned}$$

5. Functions & Formulas

(a) The quadratic formula:

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

(b) The function $f(x) = \left(x+\frac{1}{9}\right)^2 - \frac{7}{2}$ has domain $D_f : (-\infty, \infty)$ and range $R_f : \left[-\frac{7}{2}, \infty\right)$.

(c) Definition of a Derivative: $\lim_{h\to 0} \frac{f(x+h)-f(x)}{h} = f'(x)$

(d) Chain Rule: $[f(g(x))]' = f'(g(x)) \cdot g'(x)$

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

(f) $\int \sec^2 x \, dx = \tan x + C$

(g) $\int e^{2x} \, dx = \frac{1}{2}e^{2x} + C$

(h) Fundamental Theorem of Calculus, Part 1: $\int_a^b f'(x)\, dx = f(b) - f(a)$

(i) Fundamental Theorem of Calculus, Part 2: $\frac{d}{dx} \int_a^{g(x)} f(t)\, dt = f(g(x)) \cdot g'(x)$

(j) Euler's Method: $y_1 = y_0 + hF(x_0, y_0)$ where h is the step size, and $F(x,y) = \frac{dy}{dx}$

(k) $a_n = \left\{1972, \frac{1972}{2}, \frac{1972}{2^2}, \frac{1972}{2^3}, \cdots, \frac{1972}{2^n}\right\}$ represents a geometric sequence.

(l) $S_n = \sum_{n=1}^{\infty} \frac{1972}{2^n}$ is a convergent geometric series since $|r| = \left|\frac{1}{2}\right| < 1$.

(m) Taylor Series: $\sum_{n=0}^{\infty} \frac{f^{(n)}(c)}{n!}(x-c)^n$

(n) Velocity Vector: $\vec{v}(t) = x'(t)\,\vec{i} + y'(t)\,\vec{j} = \left\langle \frac{dx}{dt}, \frac{dy}{dt} \right\rangle$

(o) Area of Polar Curve: $A = \frac{1}{2}\int_\alpha^\beta r^2 \, d\theta$