```latex
\documentclass{article}
\usepackage{mathtools, amssymb, amsthm,setspace, titlesec, tipa} % imports amsmath as part o
mathtools
\titlespacing{\section}{0pt}{*0.5}{*0.5}
\title{Derivatives}
\author{Francis Njoku}
\begin{document}
\linespread{0.2}
\maketitle




If you want an **original way** to express derivatives beyond the standard notations (like \
f'(x) \), \( \frac{dy}{dx} \), or \( Df(x) \)), here are some unique ways to think about and
represent them:

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Instead of writing \( f'(x) \), you could express it as:
\[
V_f(x) = \text{"Velocity of } f(x) \text{"}
\]
This aligns with how derivatives measure the instantaneous rate of change.

Example:
\[
V_f(x) = \lim_{\Delta x \to 0} \frac{f(x + \Delta x) - f(x)}{\Delta x}
\]
So instead of saying **"take the derivative of \( f(x) \)"**, you'd say **"find the velocity
of \( f(x) \)."**

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A derivative tells us how a function **zooms in** at a point. Instead of \( f'(x) \), define
\[
Z_f(x) = \lim_{\Delta x \to 0} \frac{f(x+\Delta x) - f(x)}{\Delta x}
\]
Where \( Z_f(x) \) represents the **local magnification factor** of \( f(x) \). This makes
sense intuitively because a derivative tells you how much a function is **stretching** or
**compressing** at a given point.

Example:
If \( Z_f(x) = 3 \), then near \( x \), the function is locally behaving like \( 3x \),
stretching by a factor of 3.

---



Define:
\[
\mathcal{S}_f(x) = \text{“Slope encoding of } f(x) \text{"}
\]
which directly describes how a function is tilting at any point.

Example:
Instead of \( f'(x) = 5 \), say:
\[
\mathcal{S}_f(x) = 5 \text{, meaning } f(x) \text{ tilts at a 5-unit rise per unit run.}
\]

---
```

```latex
Imagine \( f(x) \) as an **amplifier of tangents**:
\[
A_f(x) = \frac{\text{output rise}}{\text{input run}}
\]
This is useful in physics, where derivatives measure amplification of signals (like
acceleration as an amplified velocity change).

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Define:
\[
\Lambda_f(x) = \frac{\text{tiny output change}}{\text{tiny input change}}
\]
This emphasizes that derivatives are **ratios of small changes**.

Example:
If \( \Lambda_f(x) = 7 \), then for every tiny input movement, the function stretches 7 time
as much.

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\[
These are fresh perspectives that express derivatives as **motion, zooming, encoding,
amplifying, or stretching**—all intuitive, yet mathematically valid ways to understand
change!
\]



\end{document}
```