

Nuances of \LaTeX typesetting - d for derivative

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2022-11-09T14:07:22+05:30

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If you often use \LaTeX for typesetting math then you probably have come across the issue of typesetting d of infinitesimal small quantity dx . As per the standards, the d should be typed upright. But if you write dx in \LaTeX math mode as $\text{d}x$, it will result in tilted d . In this article, we will explore a few ways of typesetting the d correctly in \LaTeX math environment.

1 The basic way

This is the first method that comes to my mind because it is straightforward and does not require loading additional packages. Use $\text{\texttt{\textbackslash text{d}x}}$ instead of $\text{d}x$.

```
 $\text{\texttt{\textbackslash ne \text{d}x}}$ 
```

RESULTS: $dx \neq dx$

One can also use $\text{\texttt{\textbackslash mathrm{d}x}}$ instead of $\text{\texttt{\textbackslash text{d}x}}$. Although there is slight difference in both typesetting logic, in this case with default fonts, both will have same output. I prefer $\text{\texttt{\textbackslash mathrm{d}x}}$ over $\text{\texttt{\textbackslash text{d}x}}$

```
 $\text{\texttt{\textbackslash ne \mathrm{d}x}}$ 
```

RESULTS: $dx \neq dx$

Though this method works perfectly, you will find it makes the equation look too cumbersome in its source form. If you need to write too many derivatives, instead of writing upright d everytime using such big command, you can make use of \LaTeX 's $\text{\texttt{\textbackslash newcommand}}$ to define a new short command to typeset the above code. This can be done by

```
\newcommand{\d}{\mathrm{d}}
```

Now you can simply use `\d` and it will print upright `d` as required.

But what if you are writing a differential equation? You need to repeat the `\d` macro multiple time along with order of derivative. Also, if you are also dealing with partial derivatives, then you may need to write a few more macros. Though doing it is possible, it is often easier and cleaner to use separate package for such tasks. One such package to handle derivatives is `physics`.

2 Using physics package

To use this package, simply use `\usepackage{physics}` in the preamble of the latex document. Now you have many commands which will help you in typesetting derivatives the right way. For example, the quantity `dx` can be written as `dx`