Excercises GSNS LaTeXbeginners

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1. make a simple document of the article class with 1 paragraph of text. Use a5paper and a font size of 10pt.
2. emphasise some text by using the command `\emph{your text}`.
3. find out what the `\newline` command does.
4. LaTeX can hyphenate words automatically. For this it needs the `babel` package, with optional argument `english`. Import this package now.
5. Try the `\quad` command in your document.
6. Add two new paragraphs to your document.
7. Now import the `parskip` package and check the results.
8. Add headings to your paragraphs by using the `section` and `subsection` commands.
9. Make a title for your document, with an author and date.
10. Add the following text to your document, pay attention to special characters:
    - { } >& 100%
11. Recreate the following text color effects. First import the `xcolor` package by adding the line: `\usepackage{xcolor}` to the preamble.
    - red green yellow
12. Write the pythagorean theorem in inline mode.
13. Use the `\frac` and `\blacksquare` command to write the following inline math: From $z = \frac{x^3}{3(y+1)^2}$ and $x > 0$ it follows that z is positive $\blacksquare$. Make sure to import the `amssymb` package first.
14. go to the wikipedia page about the dot-product (in english) and copy-paste the algebraic definition of the dot product into Overleaf in an align environment. You can copy all the mathematics on wikipedia directly into LaTeX.
15. recreate the article on the next page

COUNTEREXAMPLE TO EULER'S CONJECTURE ON SUMS OF LIKE POWERS

BY L. J. LANDER AND T. R. PARKIN

Communicated by J. D. Swift, June 27, 1966

A direct search on the CDC 6600 yielded

$$27^5 + 84^5 + 110^5 + 133^5 = 144^5$$

as the smallest instance in which four fifth powers sum to a fifth power. This is a counterexample to a conjecture by Euler [1] that at least n nth powers are required to sum to an nth power, $n > 2$.

REFERENCE

1. L. E. Dickson, *History of the theory of numbers*, Vol. 2, Chelsea, New York, 1952, p. 648.