

LATEX TEMPLATE FOR GITHUB

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ABSTRACT. Your abstract here.

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1. INTRODUCTION

Your introduction here. Include some references [1, 2, 3]. Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book. It has survived not only five centuries, but also

Date: January 6, 2026.

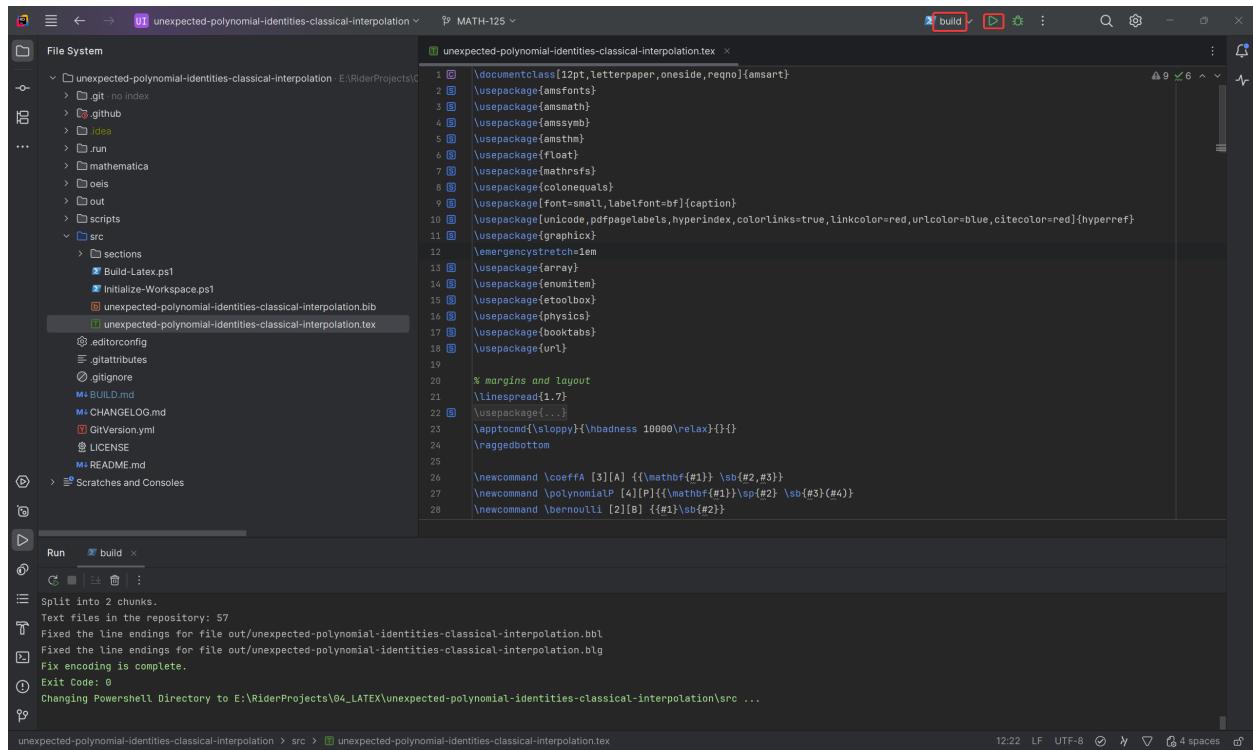
2010 Mathematics Subject Classification. 05A19, 05A10, 41A15, 11B68, 11B73, 11B83.

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the leap into electronic typesetting, remaining essentially unchanged. It was popularised in the 1960s with the release of Letraset sheets containing Lorem Ipsum passages, and more recently with desktop publishing software like Aldus PageMaker including versions of Lorem Ipsum.

Image example



The screenshot shows the Rider IDE interface with a LaTeX project open. The left sidebar displays the file system structure of the project, which includes files like `Build-Latex.ps1`, `Initialize-Workspace.ps1`, and `unexpected-polynomial-identities-classical-interpolation.tex`. The main editor window shows the LaTeX code for `unexpected-polynomial-identities-classical-interpolation.tex`. The code includes various packages such as `\documentclass`, `\usepackage{amsfonts}`, `\usepackage{amsmath}`, `\usepackage{amssymb}`, `\usepackage{amstext}`, `\usepackage{float}`, `\usepackage{mathrsfs}`, `\usepackage{colonequals}`, `\usepackage[font=small,labelfont=bf]{caption}`, `\usepackage[unicode, pdfpageLabels, hyperindex, colorlinks=true, linkcolor=red, urlcolor=blue, citecolor=red]{hyperref}`, `\usepackage{graphicx}`, `\usepackage{array}`, `\usepackage{enumitem}`, `\usepackage{toolbox}`, `\usepackage{physics}`, `\usepackage{booktabs}`, `\usepackage{url}`, and `\usepackage{raggedbottom}`. The code also includes comments for margins and layout, such as `% margins and layout`, `\linespread{1.7}`, and `\usepackage{...}`. The bottom status bar shows the current time as 12:22, file type as LF, encoding as UTF-8, and a code completion icon.

```

1 \documentclass[12pt,letterpaper,oneside,reqno]{amsart}
2 \usepackage{amsfonts}
3 \usepackage{amsmath}
4 \usepackage{amssymb}
5 \usepackage{amstext}
6 \usepackage{float}
7 \usepackage{mathrsfs}
8 \usepackage{colonequals}
9 \usepackage[font=small,labelfont=bf]{caption}
10 \usepackage[unicode, pdfpageLabels, hyperindex, colorlinks=true, linkcolor=red, urlcolor=blue, citecolor=red]{hyperref}
11 \usepackage{graphicx}
12 \usepackage{array}
13 \usepackage{enumitem}
14 \usepackage{toolbox}
15 \usepackage{physics}
16 \usepackage{booktabs}
17 \usepackage{url}
18 \usepackage{raggedbottom}
19
20 % margins and layout
21 \linespread{1.7}
22 \usepackage{...}
23 \apptocmd{\lopp}{\badness 10000\relax}{}{}
24
25
26 \newcommand{\coeffA}[3][A]{\left(\mathbf{#1}\right)\cdot\left(\mathbf{#2},\mathbf{#3}\right)}
27 \newcommand{\polynomialP}[4][P]{\left(\mathbf{#1}\right)\cdot\left(\mathbf{#2}\right)\cdot\left(\mathbf{#3}\right)\cdot\left(\mathbf{#4}\right)}
28 \newcommand{\bernhoulli}[2][B]{\left(\mathbf{#1}\right)\cdot\left(\mathbf{#2}\right)}

```

Figure 1. Image example (from caption).

m/r	0	1	2	3	4	5	6	7
0	1							
1	1	6						
2	1	0	30					
3	1	-14	0	140				
4	1	-120	0	0	630			
5	1	-1386	660	0	0	2772		
6	1	-21840	18018	0	0	0	12012	
7	1	-450054	491400	-60060	0	0	0	51480

Table 1. Coefficients $\mathbf{A}_{m,r}$. See OEIS sequences [4, 5].

$$\begin{array}{c} \left[\begin{smallmatrix} a \\ b \end{smallmatrix} \right]_m \\ \left[\begin{smallmatrix} a \\ b \end{smallmatrix} \right]_m \end{array}$$

And for any natural m we have polynomial identity

$$x^m = \sum_{k=1}^m T(m, k) x^{[k]} \quad (1)$$

where $x^{[k]}$ denotes central factorial defined by

$$x^{[n]} = x \left(x + \frac{n}{2} - 1 \right)_{n-1}$$

where $(n)_k = n(n-1)(n-2)\cdots(n-k+1)$ denotes falling factorial in Knuth's notation. In particular,

$$x^{[n]} = x \left(x + \frac{n}{2} - 1 \right) \left(x + \frac{n}{2} - 1 \right) \cdots \left(x + \frac{n}{2} - n - 1 \right) = x \prod_{k=1}^{n-1} \left(x + \frac{n}{2} - k \right) \quad (2)$$

This is an equation reference (1).

Continuing similarly, we are able to derive the formula for multifold sums of powers, which is

Theorem 1.1 (Multifold sums of powers via Newton's series). *For non-negative integers r, n, m and an arbitrary integer t*

$$\sum^r n^m = \sum_{j=0}^m \Delta^j t^m \left[\left(\sum_{s=1}^r (-1)^{j+s-1} \binom{j+t-1}{j+s} \Sigma^{r-s} n^0 \right) + \binom{n-t+r}{j+r} \right]$$

Proof. By Newton's series for power and repeated applications of the segmented hockey stick identity. \square

Proposition 1.2 (Falling factorial).

$$(x)_n = x(x-1)(x-2)(x-3)\cdots(x-n+1) = \prod_{k=0}^{n-1} (x-k)$$

Proposition 1.3.

$$\frac{(x)_n}{n!} = \binom{x}{n}$$

1.1. Rising factorials.

Proposition 1.4 (Rising factorial).

$$x^{(n)} = x(x+1)(x+2)(x+3)\cdots(x+n-1) = \prod_{k=0}^{n-1} (x+k)$$

Proposition 1.5.

$$\frac{x^{(n)}}{n!} = \binom{x+n-1}{n}$$

1.2. Central factorials.

Lemma 1.6 (Central factorial).

$$n^{[k]} = n \left(n + \frac{k}{2} - 1 \right) \left(n + \frac{k}{2} - 2 \right) \cdots \left(n - \frac{k}{2} + 1 \right) = n \prod_{j=1}^{k-1} \left(n + \frac{k}{2} - j \right)$$

Proposition 1.7.

$$n^{[k]} = n \left(n + \frac{k}{2} - 1 \right)_{k-1}$$

1.3. Derivatives.

$$\frac{dx}{dy} = \frac{f(x+h) - f(x)}{h}$$

$$\frac{d^3x}{dy^3} = \frac{f(x+h) - f(x)}{h}$$

CONCLUSIONS

Conclusions of your manuscript.

Here is an itemize list with adjusted margins

- Conclusion 1
- Conclusion 2
- Conclusion 3

ACKNOWLEDGEMENTS

The author is grateful to [Full Name] for his valuable contribution [contribution] about the fact that [interesting claim].

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