The complexpolylongdiv Package

Vafa Khalighi

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If you want to report any bugs or typos and corrections in the documentation, or ask for any new features, or suggest any improvements, or ask any questions about the package, then please use the issue tracker:

https://github.com/xepersian/complexpolylongdiv/issues

In doing so, please always explain your issue well enough, and always include a minimal working example showing the issue.

You may also have conversations, ask questions and post answers without opening issues using the Discussions space:

https://github.com/xepersian/complexpolylongdiv/discussions

The announcements for the new releases of the package will also appear in the Discussions space under the Announcements category.

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1 Introduction

To the best of my knowledge, there is no TEX package for typesetting (complex) polynomial long division. The complexpolylongdiv package provides a simple interface for typesetting (complex) polynomial long division.

The package does not provide automatic (complex) polynomial long division at present and the long division should be done by hand. However, if there is enough interest in the package, I will add this feature in the next version.

2 Using the package

2.1 Loading The Package

You can load the package in the ordinary way:

`\usepackage{`*complexpolylongdiv*`}`

2.2 The user interface

The package provides the environment `complexpolylongdiv` and the control sequence `\complexpolyquotient` for typesetting (complex) polynomial long division.

2.2.1 The `complexpolylongdiv` environment

`\begin{complexpolylongdiv}` `[pos]` ⟨*content*⟩ `\end{complexpolylongdiv}`

The `[pos]` is optional and determines the vertical alignment of the (complex) polynomial long division. If `pos` is `t`, then the ⟨*content*⟩ is placed vertically at the top and if `pos` is `b`, then the ⟨*content*⟩ is placed vertically at the bottom; otherwise, the ⟨*content*⟩ is placed vertically at the center (the default when the optional `[pos]` is omitted).

2.2.2 The control sequence \complexpolyquotient

\complexpolyquotient{⟨*quotient*⟩}

The control sequence \complexpolyquotient typesets ⟨*quotient*⟩.

2.3 An Example

```
\documentclass{article}
\usepackage{complexpolylongdiv}
\begin{document}
\begin{equation}
\begin{complexpolylongdiv}
&x+1-2i \\
x-1&\complexpolyquotient{x^2-2ix+6}\\
-&\underline{x^2-x}\\
  -&(1-2i)x+6\\
  -&\underline{(1-2i)x-(1-2i)}\\
  &7-2i
\end{complexpolylongdiv}
\end{equation}
\end{document}
```

$$\begin{array}{rl} & x+1-2i \\ x-1 \,\big)\, & \overline{x^2-2ix+6} \\ - & \underline{x^2-x} \\ - & (1-2i)x+6 \\ - & \underline{(1-2i)x-(1-2i)} \\ & 7-2i \end{array} \tag{1}$$

3 Implementation

```
\NeedsTeXFormat{LaTeX2e}
\ProvidesPackage{complexpolylongdiv}[2024/12/30 v0.2 Typesetting (complex) polynomial long div
\newenvironment{complexpolylongdiv}[1][c]{%
  \let\\\@arraycr
  \if #1t
    \vtop
  \else
    \if#1b
      \vbox
    \else
      \vcenter
    \fi
  \fi
  \bgroup
    \normalbaselines
    \offinterlineskip
    \setbox\strutbox\hbox{%
      \vrule height 2.1ex depth .5ex width0ex}%
      \tabskip=0pt
      \halign\bgroup
        \hfil$##$&$\,\hphantom{\big)}\mkern2mu ##$\hfil\strut\cr
```

```
}{%
      \crcr
    \egroup
  \egroup
}
\newcommand*{\complexpolyquotient}[1]{%
  \omit$\,
  \overline{%
    \vphantom{\big)}%
    \hbox{%
      \smash{%
        \raise3.5\fontdimen8\textfont3\hbox{$\big)$}}%
      }%
    }%
    \mkern2mu #1
  }$%
}
```

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Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.