The Xmath[1] LaTeX 2ε Macros for Manuscript Preparation

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Abstract

The Xmath[1] *package is an esay way to write math in LaTeX 2ε.* Xmath[1] *is an extension of frequently used mathematical packages with new commands for specific sets, arrows and operators. This package also implements useful shortcuts.*

Contents

1 Patch notes

This is the version 3.1.0 of Xmath[1]. This release brings the addition of new commands for specific sets, objects and others, as well as minor bug fixes. This document was last compiled on October 16, 2021.

2 Extensions

This package is an extension of the amssymb[5], amsmath[6] and dsfont[3] packages. All rights reserved to their authors.

3 Package option

By default, no options are loaded when calling the Xmath[1] package. However, at the time of import, it is possible to call

```
\usepackage[mathbb]{xmath}
```

which has the effect of making available shortcuts of the form `\I<X>` where `<X>` is a majuscule letter taken in the alphabetical range [*A* - *Z*]. For instance, you can use `\IC` instead of `\mathbb{C}`.

4 Commands

4.1 Arrows and symbols

\asign : :=.
\hooklongleftarrow : $\longleftarrow$.
\hooklongrightarrow : $\longrightarrow$.
\longsimleftarrow : $\leftarrow$.
\longsimrightarrow : $\rightarrow$.
\longtwoheadleftarrow : $\twoheadleftarrow$.
\longtwoheadrightarrow : $\longrightarrow$.
\signa : =:.
\simleftarrow : $\leftarrow$.
\simrightarrow : $\rightarrow$.
\rest{<f>}{<S>} : the restriction of <f> on <S>.
\widebar : adaptive bar solving the size problems of \bar and \overline.

4.2 Specific sets

\Alt : alternating.
\Ann : annihilator.
\Aut : automorphism.
\coker : coker.
\dom : domain.
\End : endomorphism.
\Frac : fraction.
\Gal : Galois.
\gen{<x>} : generated by <x>.
\GL : linear group.
\Graph : graph.
\Hom : homomorphism.
\im : image.
\Int : interior.
\Orb : orbit.
\quot{<A>}{<B>} : quotient of <A> by <B> with an adaptive style.
\Rac : roots (french).
\range[<type>]{<x>}{<y>} : produces a correctly displayed interval from <x> to <y> of the type <type> taking the value of cc (default), co, oc or oo where c means closed and o means open.
\set[<size>]{a|b} : displays a set of the size <size> – for instance \Big – of the form

$$\{a \mid b\}.$$

The use of the | character is important, it is used to delimit the two areas within the set.
\SL : special linear.
\SO : special orthogonal.
\Stab : stabilizer.
\Syl : Sylow.
\Sym : symmetric.
\ZnZ{<n>} : ring of integers modulo <n> with an adaptive style.

4.3 Objects

\func[<a>]{<f>}{<I>}{<O>}{<x>}{<y>} : displays the definition of a function. In inline mode, this produces

$$\texttt{<f>}\colon \texttt{<I>} \to \texttt{<O>}\colon \texttt{<x>} \mapsto \texttt{<y>}.$$

where the variable <a> can be replaced by an arrow. For this example, I used \rightarrow. By default, the arrow is set to \longrightarrow. In display math mode, this produces

$$\texttt{<f>}\colon \begin{array}{ccc} \texttt{<I>} & \longrightarrow & \texttt{<O>} \\ \texttt{<x>} & \longmapsto & \texttt{<y>} \end{array}.$$

The \bfunc command is used in the same way but produces the following result in a

display math

$$\texttt{<f>}: \begin{cases} \texttt{<I>} & \longrightarrow & \texttt{<O>} \\ \texttt{<x>} & \longmapsto & \texttt{<y>} \end{cases}.$$

\afunc[<a>]{<I>}{<O>}{<x>}{<y>} : displays the definition of an anonymous function. In inline mode, this produces

$$\texttt{<I>} \to \texttt{<O>}: \texttt{<x>} \mapsto \texttt{<y>}.$$

where the variable <a> can be replaced by an arrow. For this example, I used \rightarrow. By default, the arrow is set to \longrightarrow. In display math mode, this produces

$$\begin{array}{lcl} \texttt{<I>} & \longrightarrow & \texttt{<O>} \\ \texttt{<x>} & \longmapsto & \texttt{<y>} \end{array}.$$

The \abfunc command is used in the same way but produces the following result in a display math

$$\begin{cases} \texttt{<I>} & \longrightarrow & \texttt{<O>} \\ \texttt{<x>} & \longmapsto & \texttt{<y>} \end{cases}.$$

\link[<a>]{<f>}{<I>}{<O>} : displays the definition of a link. This produces

$$\texttt{<f>}: \texttt{<I>} \to \texttt{<O>}$$

where the variable <a> can be replaced by an arrow which is by default \longrightarrow. \alink[<a>]{<I>}{<O>} : displays the definition of an anonymous link. This produces

$$\texttt{<I>} \to \texttt{<O>}$$

where the variable <a> can be replaced by an arrow which is by default \longrightarrow. \vect[<d1>][<d2>]{<v>} : instantiates a vector of the form

$$\texttt{<v>}_{\texttt{<d1>}}, \ldots, \texttt{<v>}_{\texttt{<d2>}}.$$

If there is no optional argument, then it creates a vector of the variable <v> from 1 to n. If <d1> is present and if <d1> is an integer, then it creates a vector of the variable <v> from <d1> to n. However, if <d1> is not an integer, then it creates a vector of the variable <v> from 1 to <d1>. Finally, if every argument is present, then it creates a vector of the variable <v> from <d1> to <d2>.

4.4 Operators

\adh : adherence.
\Car : characteristic (french).
\card : cardinality.
\cis : $x \mapsto \cos(x) + i\sin(x)$ contraction.
\dist : distance.
\ev : evaluation.
\Frob : Frobenius.
\Id : identity.
\ord : order.
\pgcd : greatest common divisor (french).
\ppcm : least common multiple (french).
\sign : signature.

4.5 Others

\eg : exempli gratia.
\ie : id est.
\Xmath : **Xmath** logo.

5 Contact

If you have a suggestion or if you encounter a problem with the XMATH[1] package, send me a pull request on :
https://github.com/MartinDbx/xmath.

References

[1] Martin Debaisieux. Github repository. https://github.com/MartinDbx/xmath.

[2] Martin Debaisieux. Github repository. https://github.com/MartinDbx/xwriter.

[3] Taco Hoekwater Jeremy Gibbons and Alan Jeffrey. Ctan. https://www.ctan.org/pkg/stmaryrd.

[4] Debaisieux Martin. https://github.com/MartinDbx.

[5] The American Mathematical Society. Ctan. https://www.ctan.org/pkg/amsfonts.

[6] The American Mathematical Society. Ctan. https://www.ctan.org/pkg/amsmath.

Releases

v2.0.1 : February 19, 2021.
Creation of new commands and environments.

v3.1.0 : October 16, 2021.
This new major update gets rid of old, unnecessary commands and packages and brings the `mathbb` option, which prevents users from being flooded with unwanted shortcuts. All previous environments have been removed and brought together in the new XWRITER[2] package dedicated to the writing and layout.