

Commutative Diagrams for L^AT_EX

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Commutative diagrams These were adapted from those in $\mathcal{A}\mathcal{M}\mathcal{S}$ -T_EX (see p. 146 of *The Joy of T_EX*). All of the horizontal “arrows” will stretch with the superscripts and subscripts. These can also be used outside of `\CD`, where they will be somewhat shorter. You must put ‘`cd`’ in with the other style options, for example `\documentstyle[12pt,cd]{article}`. The @-commands from the $\mathcal{A}\mathcal{M}\mathcal{S}$ -T_EX still work, but the new `\cd`-style is the preferred format. The table below shows the arrows and names, along with suggested abbreviations.

Arrow	Name	Abbr.	Arrow	Name	Abbr.
→	<code>\cd\rightarrow, \cd></code>	<code>\cdr</code>	←	<code>\cd\leftarrow, \cd<</code>	<code>\cdl</code>
⇔	<code>\cd\rightrightarrows</code>	<code>\cdrl</code>	⇔	<code>\cd\leftrightharrows</code>	<code>\cdlr</code>
↑	<code>\cd\uparrow</code>	<code>\cdud</code>	↓	<code>\cd\downarrow</code>	<code>\cdd</code>
↑↓	<code>\cd\updownarrows</code>	<code>\cdud</code>	↓↑	<code>\cd\downuparrows</code>	<code>\cddu</code>
	<code>\cd </code>			<code>\cd\ </code>	
=	<code>\cd=</code>		None	<code>\cd.</code>	

Example

```


$$\begin{array}{ccc}
 G & \begin{array}{c} \xleftarrow{\gamma} \\ \xrightarrow{\delta} \end{array} & H & \xrightarrow{\Delta} & K \\
 & & f \uparrow & \downarrow g & h \downarrow k \\
 0 & \longrightarrow & G' & \xrightarrow{\beta} & H'
 \end{array}$$


```

`$$\begin{array}{ccc}
 G & \begin{array}{c} \xleftarrow{\gamma} \\ \xrightarrow{\delta} \end{array} & H & \xrightarrow{\Delta} & K \\
 & & f \uparrow & \downarrow g & h \downarrow k \\
 0 & \longrightarrow & G' & \xrightarrow{\beta} & H'
 \end{array}$$`

The abbreviations were made with the following `\newcommand`'s at the top of the file:

```

\newcommand{\cdrl}{\cd\rightrightarrows}
\newcommand{\cdlr}{\cd\leftrightharrows}
\newcommand{\cdr}{\cd\rightarrow}
\newcommand{\cdl}{\cd\leftarrow}
\newcommand{\cdud}{\cd\uparrow}
\newcommand{\cdd}{\cd\downarrow}
\newcommand{\cdud}{\cd\updownarrows}
\newcommand{\cddu}{\cd\downuparrows}

```

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