Mathematics for TeX archive

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Intro

This documents lists mathematics for TeX snippets. Copy to `inc_mathematics.tex` (or do anything else) as required.

Environments

This works in article et al., but b0rks in presentation.

```
% --- math packages (in ArchLinux they're all part of TeXLive) ---
\usepackage{amsmath}   % has to come before eulerum, or things bork!
\usepackage{amsthm}    % required for proof environ (et al.).
\usepackage{amssymb}   % required (at least) for proof environ black square.
% --- END math packages ---

% If no newline after theorem et al environment,
% then no indentation either.
\makeatletter
\patchcmd{\@endtheorem}{\@endpefalse}{}{}{}
\patchcmd{\endproof}{\@endpefalse}{}{}{}
\makeatother

% math theorem environments
\newtheorem{theorem}{Theorem}[section]
\newtheorem{corollary}[theorem]{Corollary}
\newtheorem{lemma}[theorem]{Lemma}
\newtheorem{definition}[theorem]{Definition} % 'def' cannot be used as environ name.
\theoremstyle{remark}
\newtheorem{remark}[theorem]{Remark}

\renewcommand\qedsymbol{$\blacksquare$}
```

Quantifiers

It's a cheat but this makes spacing less wrong around quantifiers:

```
\DeclareMathOperator{\Nexists}{\nexists}
\DeclareMathOperator{\Exists}{\exists}
\DeclareMathOperator{\Forall}{\forall}
```

Algebraic stuff

For set conditional definition. Unknown for presentation.

```
\usepackage{mathtools}
% https://tex.stackexchange.com/questions/180308/why-dont-the-curly-braces-and-the-mid-bar-
\providecommand\given{}  % just to make sure it exists
\newcommand\SetSymbol[1][]{\nonscript\:#1\vert\nonscript\:\allowbreak}
\DeclarePairedDelimiterX\Set[1]\lbrace\rbrace{%
  \renewcommand\given{\SetSymbol[\delimsize]}#1}
```

For \norm and \abs (starred versions grow when needed):

```
\usepackage{mathtools}
\DeclarePairedDelimiter\abs{\lvert}{\rvert}
\DeclarePairedDelimiter\norm{\lVert}{\rVert}
```

Relation vs. Operator

Short and simple:

```
% \mid -> binary relation
% \vert -> binary operator
```