The neoschool class (v1.3.27)

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The neoschool class provides secondary school teachers with a comprehensive toolkit for creating educational documents (tests, course handouts, exercise sheets with answer keys, and more). To accommodate a wide range of needs, it offers sixty-five built-in color themes, twenty-two preconfigured profiles, extensive class options for layout and typography, specialized environments, dedicated commands, and various preformatted header styles for each type of document. It bundles dozens of commonly used LaTeX packages, which significantly reduces preamble clutter and helps avoid compatibility issues. Multilingual support is included for English, French, and German.

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① Preconfigured profiles

The **profile**=name option automatically sets up a coherent group of options tailored to a specific type of document. Each profile defines a theme, title layout, box styles, and visual settings suited to a particular use case. An explicitly given option always overrides the profile. In exam, swiss and elegant, theorem frames and backgrounds are off, so theorems take the raw style.

- **academic**: well suited for lectures and course handouts. Theme royal, title layout band, theorem style block, exercise style bar, admonition style modern, code style plain, boxshape soft.
- **minimalist**: clean, pared-down style. Theme ink, title layout stream, theorem style plain, exercise style line-outline, admonition style classic, code style lines, boxshape sharp.
- **material**: inspired by Material Design. Theme azure, title layout notion, theorem style tile, exercise style capsule, admonition style material, code style shadow, boxshape rounded.
- **coder**: for technical and computer science documents. Theme marine, title layout blocks, theorem style bar, exercise style shell, admonition style professional, code style frame, boxshape chamfer.
- **memo**: for review sheets and compact summaries. Theme lagoon, title layout bristol, theorem style sticker, exercise style badge, admonition style soft, code style plain, boxshape chat.
- **exam**: for tests and proctored assessments. No theme enforced (uses the default or whatever the user specifies), title layout eval, theorem style plain, exercise style inline, admonition style classic, code style plain, boxshape sharp. Enables print mode (black and white).
- **organic**: natural look with soft shapes. Theme forest, title layout flow, theorem style curve, exercise style capsule, admonition style soft, code style plain, boxshape leaf.
- **origami**: geometric style with creases. Theme crimson, title layout geometric, theorem style fold, exercise style rule, admonition style classic, code style lines, boxshape bevel.
- **blueprint**: technical drafting style. Theme frost, title layout grid, theorem style frame, exercise style counter-inline, admonition style classic, code style lines, boxshape sharp.
- **swiss**: inspired by Swiss graphic design. Theme crimson, title layout brush, theorem style bar, exercise style capsule-outline, admonition style modern, code style lines, boxshape southeast.
- **creative**: for playful, colorful handouts. Theme neon, title layout memphis, theorem style pastel, exercise style badge, admonition style material, code style shadow, boxshape sharpish.
- **focus**: understated style with a side accent. Theme rhodium, title layout spine, theorem style tag, exercise style capsule, admonition style classic, code style frame, boxshape west.
- **elegant**: refined and stripped-back. Theme velours, title layout minimal, theorem style bar, exercise style line-circle, admonition style classic, code style line, boxshape sharp.
- **slate**: sober style with a side banner. Theme slate, title layout band, theorem style tile, exercise style bar, admonition style professional, code style lines, boxshape sharp.
- **maker**: technical style for DIY projects. Theme terra, title layout tech, theorem style sticker, exercise style rule, admonition style classic, code style lines, boxshape sharp.
- **zen**: calm, harmonious style. Theme moss, title layout wave, theorem style block, exercise style line-outline, admonition style soft, code style shadow, boxshape sharpish. Enables unicolor mode.

  Profiles inspired by major scientific publishers: black ink, no frames or backgrounds, raw theorems, headers, footers and parts specific to each house. Each one sets its font only when **mainface**, **sansface** or **mathface** are not given, with a fallback font from TEX Live.

- **amslike**: American Mathematical Society articles. Title layout amslike (bold centered capitals, author in small capitals), sections "1." in small capitals at text size, run-in subsections, theorem notes in upright medium, proofs ending with an open square. New Computer Modern font (mlmodern under pdfLaTeX), Latin Modern as fallback.

- **mirlike**: Mir Publishers books. Title layout `mirlike` (subject in spaced capitals, short rule), paragraphs "§ 1.", centered italic subsections, letterspaced proof heading. Literaturnaya when installed (including letters and digits in formulas under LuaLaTeX), otherwise TeX Gyre Schola.
- **physlike**: physics journals in the style of *Physical Review*. Title layout `physlike` (subject as affiliation, date in parentheses), sections "I." in bold capitals, centered subsections "A.". STIX Two font; combines with **twocolumn**.
- **springerlike**: Springer textbooks. Title layout `springerlike` (gray box including the author; variant `springerrule` with a rule), bold sans headings aligned left, bold roman theorem headings, italic running title. TeX Gyre Termes and TeX Gyre Heros.
- **ieeelike**: IEEE journals and conferences, two columns. Title layout `ieeelike`, bold abstract introduced by "*Abstract*—", sections "I." in small capitals, italic subsections "A.", italic theorem headings followed by a colon with upright statements. TeX Gyre Termes.
- **acmlike**: ACM publications, two columns. Title layout `acmlike` aligned left, abstract under a capitalized heading, sections "1" in bold capitals, theorem headings in small capitals. Libertinus font.

The `ieeelike` and `acmlike` profiles switch the document to two columns unless the **onecolumn** option is given.

```
% Using a profile
\documentclass[profile=academic]{neoschool}

% Customizing a profile
\documentclass[profile=exam, theme=midnight]{neoschool}
```

2 Loaded packages

The following packages are automatically loaded by the `neoschool` class.

adforn	fontawesome5	pdftexcmds	tcolorbox
adjustbox	forest	pgffor	tikz
algpseudocode	iftex	pgfplots	tikzpagenodes
bookmark	kvoptions	pifont	tikzsymbols
calc	lastpage	qrcode	ulem
changepage	marginnote	scrlayer-scrpage	wrapfig
colortbl	mathtools	setspace	xcolor
cuted	microtype	silence	xhfill
enumitem	multicol	siunitx	xkeyval
environ	nccmath	tabularray	xsim
etoolbox	needspace	tasks	xstring

When compiling with `pdflatex`, the class loads `fontenc` (with the `T1` option), `inputenc` (with the `utf8` option), `newpxtext`, and `newpxmath`. When compiling with `lualatex`, it makes `fontspec`, `luacas`, `lua-ul`, and `luacolor` available, and applies the `TeX Gyre Pagella` and `TeX Gyre Heros` fonts alongside `newpxmath`.

2.1 Optional packages

- **faketext**: loads `blindtext` and `lipsum` for placeholder text.

- **mathastext**: loads `mathastext` to use the text font in math mode.
- **nomath**: disables the mathematics bundle that is loaded by default (`annotate-equations`, `bm`, `cancel`, `esvect`, `mathrsfs`, `ncccomma`, `numprint`, `tdsfrmath`, `tkz-euclide`, `tkz-tab`, `witharrows`, and `xlop`). Use this option for documents that do not require advanced mathematical typesetting, to reduce compilation time.
- **notes/leftnotes/rightnotes**: load `todonotes`.
- **noteswidth**=`dim`, **notesposition**=`left|right|alternate`: detailed form of the above.
- **apmep**: loads a bundle of packages for compiling APMEP past exam papers, including `diagbox`, `esvect`, `fourier-orns`, `numprint`, `pstricks` and its ecosystem, `scratch3`, `tabularx`, `textcomp`, and `variations`. Replace the whole preamble of the paper by the single line `\documentclass[apmep]{neoschool}` (its `\newcommand`s would clash) and compile with `lualatex` or `xelatex`: `pdflatex` cannot produce the PSTricks figures without `auto-pst-pdf` and `--shell-escape`.
- **mathics**: loads `asymptote` and `latexalpha2` for computer algebra via Mathics.

3 Configuration options

3.1 Language

- **english**, **french**, **german**: enables the translations and conventions for each language. These options affect environment labels, typographic rules, and math conventions. The `french` option also loads `frenchmath`.
- **nofrenchmath**: with the `french` option, skips the loading of `frenchmath`.
- **nofrenchlist**: disables the French list style (switches dashes back to bullets).
- **tthyphenation**: restores language hyphenation patterns inside `\texttt` (off by default: inline code only breaks after an underscore, a slash or an opening parenthesis, and before a dot followed by a letter), for narrow layouts where a long identifier would otherwise overflow.
- **frenchlistaspar**: treats lists as paragraphs in French.

3.2 Global appearance

3.2.1 Built-in themes

The **theme**=`name` option sets the document's color theme. There are 68 themes available, grouped below by color family.

Near black `graphite`, `mineral`

Dark slate `athenee`, `axiom` (default), `prestige`, `renaissance`, `sequoia`, `studio`

Navy `dusk`, `excellence`, `library`, `marine`, `midnight`, `neon`, `nocturne`, `retro`, `rubis`, `taiga`, `twilight`

Blues `azure`, `ink`, `rhodium`, `royal`, `slate`, `trinity`, `velours`

Teal `arctic`, `atoll`, `frost`, `lagoon`, `mist`, `oceanic`, `reef`, `tundra`, `woodland`

Greens `eton`, `forest`, `garden`, `hearth`, `ivy`, `jewel`, `manor`, `moss`, `sage`

Purples `amethyst`, `mulberry`, `opera`, `velvet`, `wisteria`

Reds and burgundy `aurora`, `bordeaux`, `crimson`, `harvard`, `heritage`, `mahogany`, `orchid`, `oxblood`, `peony`, `pomegranate`, `vivid`

Browns and ochre `coffee`, `cyprus`, `ember`, `olive`, `saffron`, `sienna`, `study`, `terra`

Each theme defines four colors: a primary color (titles, sections, definitions), a secondary color (theorems), a tertiary color (exercises), and a structural color (neutral elements such as remarks and inline code).

```
\documentclass[theme=oceanic]{neoschool}
```

3.2.2 *Color modes*

- **print**: black and white, for printing.
- **unicolor**: uses the primary color for every environment.
- **darktheme**: enables a dark theme with a dark background and light text.

3.2.3 *Color customization*

- **globalcolor**=`color`: body text color (default: `black`).
- **titlecolor**=`color`: main title color (no effect on `magazine` and `banner`).
- **titlehexcolor**=`RRGGBB`: main title color in hexadecimal.
- **headcolor**=`color`: `\section` heading color.
- **subcolor**=`color`: `\subsection` heading color.
- **subsubcolor**=`color`: `\subsubsection` heading color.
- **headfootcolor**=`color`: header and footer color (default: a neutral grey derived from the text color).

3.2.4 *Box appearance*

Frames and backgrounds:

- **thmnoframe** / **thmframe**: toggles theorem frames.
- **thmnoback** / **thmback**: toggles theorem backgrounds.
- **codenoframe** / **codeframe**: toggles code block frames.
- **codenoback** / **codeback**: toggles code block backgrounds.
- **codenonum** / **codenum**: toggles line numbering in code blocks.
- **exnoback** / **exback**: toggles exercise backgrounds.
- **exnoframe** / **exframe**: toggles exercise frames.
- **noback** / **back**: toggles all backgrounds.
- **noframe** / **frame**: toggles all frames.
- **clean**: disables all frames and backgrounds.
- **styled**: enables all frames and backgrounds.

Background opacity:

- **boxopacity**=`n`: global background opacity (0–100, default: 8).
- **thmboxopacity**=`n`: theorem background opacity (default: 8).
- **exboxopacity**=`n`: exercise background opacity (default: 0).
- **codeboxopacity**=`n`: code block background opacity (default: 8).
- **adboxopacity**=`n`: admonition background opacity (default: 8); at 0 with `adstyle=soft`, the box also loses its inner margins and lines up with the text.
- **mathboxopacity**=`n`: math highlight background opacity (default: 15).

Frame opacity:

- **frameopacity**=n: global frame opacity (0–100).
- **thmframeopacity**=n: theorem frame opacity (default: 90).
- **exframeopacity**=n: exercise frame opacity (default: 95).
- **codeframeopacity**=n: code block frame opacity (default: 90).
- **adframeopacity**=n: admonition frame opacity (default: 90).
- **sideframeopacity**=n: sidebyside frame opacity (default: 90).
- **neoframeopacity**=n: frame opacity for `neobox` and `inlinebox` (default: 90).

Border thickness:

- **border**=`dim`: global border thickness.
- **thmborder**=`dim`: theorem border thickness (default: 0.8pt).
- **exborder**=`dim`: exercise border thickness (default: 0.8pt).
- **codeborder**=`dim`: code block border thickness (default: 0.5pt).
- **adborder**=`dim`: admonition border thickness, `classic` and `minimal` styles (default: 0.8pt).

Internal padding:

- **padding**=`value`: adjusts internal padding of boxes. *Options:* `tight`, `loose`, `normal` (default).

Corner radii:

- **boxarc**=`dim`: global corner radius applied to every box whose specific radius is not set.
- **thmboxarc**=`dim`: corner radius for theorems (default: `3pt`).
- **exboxarc**=`dim`: corner radius for exercises (default: `3pt`).
- **codeboxarc**=`dim`: corner radius for code blocks (default: `3pt`).
- **sideboxarc**=`dim`: corner radius for `sidebyside` (default: `3pt`).
- **adboxarc**, **neoboxarc**=`dim`: corner radius for admonitions, `neobox` and answer areas (default: `3pt`).
- **pseudoboxarc**=`dim`: corner radius for `pseudocode` (default: `3pt`).
- **sectionarc**=`dim`: corner radius for section headings (`highlighted` or `shaded` style, default: `0pt`).

Box shapes: The **boxshape**=`shape` option sets the overall corner shape of boxes. Element-specific overrides are available: **thmboxshape**, **exboxshape**, **codeboxshape**, **adboxshape**, **neoboxshape**, **sideboxshape**. Two additional options let you give the theorem title label a different shape than the main box:

- **thmtitleshape**=`shape`: shape of the title label (inherits from `thmboxshape` if not set, default: `rounded`).
- **thmtitlearc**=`dim`: corner radius of the title label (inherits from `thmboxarc` if not set, default: `3pt`).

Available shapes:

- `rounded` (default): standard rounded corners.
- `soft`: slightly rounded corners.
- `sharp`: square corners.

- `sharpish`: very slightly rounded corners.
- `curve`: pronounced curved corners.
- `bevel`: chamfered corners.
- `chamfer`: angular beveled corners.
- `chat`: speech-bubble style.
- `leaf`: leaf-shaped rounded corners.
- `northeast`, `northwest`, `southeast`, `southwest`: rounding on a single corner.
- `north`, `south`, `east`, `west`: rounding on one side.
- `downhill`, `uphill`: diagonally rounded corners.

Title terminators:

- **thmterminator**=`text`: terminator after theorem titles (default: `.\!`).
- **thmseparator**=`text`: separator between the name and custom title.
- **adterminator**=`text`: terminator for admonitions (default: `.`).
- **exterminator**=`text`: terminator for exercises (default: `.`).
- **adseparator**, **codeseparator**=`text`: separator before an admonition subtitle, before a listing or algorithm title.
- **boxtitle**=`options`: `tcolorbox` options added to code block titles, for example `fonttitle=\bfseries`.

3.2.5 *Other display options*

- **inlinecodebox**: renders inline code (`\texttt`) in a framed, colored box.
- **inlineadmonition** (default): admonition title and body on the same line (styles `minimal`, `modern` and `soft`; the others keep a title bar).
- **blockadmonition**: forces admonition body below the title.

3.3 Typography

3.3.1 *Fonts*

- **mainface**=`Font`: main (serif) font. A list in braces gives fallback fonts: the first available one is used, with a warning. The same holds for **sansface**, **monoface** and **mathface**; under pdfLaTeX, the list holds package names.

  Example: `mainface={Minion 3, TeX Gyre Pagella}`.
- **mainfaceoptions**=`options`: options for the main font, for example `AutoFakeBold=2` for a synthetic bold when the font has none (the class warns about it).
- **mainfacescale**=`factor`: scale factor (default: 1.0).
- **sansface**=`Font`: sans-serif font.
- **sansfaceoptions**=`options`: options for the sans-serif font.
- **sansfacescale**=`factor`: scale factor (default: 1.0).
- **monoface**=`Font`: monospaced (code) font.
- **monofaceoptions**=`options`: options for the monospaced font.
- **monofacescale**=`factor`: scale factor (default: 1.0).

- **mathface**=`Font`: math font.
- **mathfaceoptions**=`options`: options for the math font.
- **mathfacescale**=`factor`: scale factor for math.
- **facefamily**=`Family`: full font family.
- **facefamilyoptions**=`options`: options for the family.
- **sfbody**: uses the sans-serif font for the body text.
- **sfall**: uses the sans-serif font for the entire document.
- **mathastext**: uses the text font for math.
- **mathletters**, **mathletters**=`Font`: under LuaLaTeX, sets the Latin letters and digits of formulas (and Greek letters when the font has them) in the text font, or in the given font; symbols stay in the math font.
- **mathlettersoptions**=`options`: fontspec options added to the formula letters, for example `FakeBold=1` to match their weight to the text.
- **semibold**: enables automatic detection of the SemiBold variant of the configured fonts (used by `\sbseries` or `\textsb`). Enable it only when the chosen font actually ships a SemiBold weight. Disabled by default to avoid the luaotfload "Reload initiated" message on fonts without a SemiBold variant; in that case `\sbseries` falls back to `\bfseries`.

3.3.2 *Heading styles*

Global styles:

- **headfamily**=`family`: which of the document fonts is used for headings, `rmfamily`, `sffamily` or `ttfamily` (default: `sffamily`).
- **headweight**=`weight`: font weight (default: `bfseries`); also applies to admonition titles, except the `material` label.
- **headshape**=`shape`: font shape (default: `upshape`).

Per element: each element has its own family, weight and shape, inherited from the global setting:

- **sectionfamily**, **sectionweight**, **sectionshape**: sections and subsections; **sectionshape** only applies when given.
- **thmfamily**, **thmweight**, **thmshape**: headings of theorems and related environments.
- **exfamily**, **exweight**, **exshape**: headings of exercises and solutions.
- **adfamily**, **adweight**, **adshape**: admonition titles.

  Example: `headweight=mdseries, sectionweight=bfseries` sets every heading in medium weight except sections.

Main title:

- **titlefamily**=`family`: inherits from `headfamily` (no effect on `magazine`, `memphis`, `bauhaus`).
- **titleweight**=`weight`: inherits from `headweight` (same exceptions).
- **titleshape**=`shape`: default `upshape`.
- **titlesize**=`size`: title size (default: `LargeLARGEminus`); no effect on `magazine`, `bristol`, `memphis`, `bauhaus`, `mockexam`, `shortexam`, `shortlesson`.

Options: `tinyscriptsize`, `scriptsizefootnotesize`, `footnotesizesmall`, `smallnormalsize`, `normalsizelarge`, `largeLarge`, `LargeLARGEminus`, `LargeLARGE`, `LargeLARGEplus`, `LARGEhuge`, `hugeHuge`, or a standard size such as `Large`.

- **titlealign**=`align`: alignment `left`, `center`, `right` (default: `center`), for `default`, `titlebox`, `tighttitle`, `onlytitle` and `shorttitle`.
- **titledecor**=`decor`: decoration below the title (default: `none`).

  Options: `none`, `ornament`, `rule`, `midrule`, `fullrule`.

Sections:

- **sectionnumstyle**=`style`: number appearance (default: `circle`).

  Options: `circle`, `box`, `dash`, `plain`, `period` ("1."), `para` ("§ 1.").
- **sectiontextstyle**=`style`: text case (default: `sc`).

  Options: `sc`, `upper`, `lower`, `smallcaps` (small capitals at text size), `caps` (capitals at heading size).
- **sectionstyle**=`style`: visual style (default: `normal`).

  Options: `normal`, `ornaments`, `underline`, `highlighted`, `shaded`, `shadedline`.
- **sectionalign**=`align`: alignment `left`, `center`, `right` (default: `center`).

Headers and footers:

- **headfootfamily**=`family`: inherits from `headfamily`.

3.4 Page layout

3.4.1 *Margins and spacing*

- **margin**=`dim`: horizontal margin width (default: `1.5cm`).
- **indent**=`dim`: paragraph indentation (default: `1em`).
- **noindent**: removes paragraph indentation.
- **parskip**=`value`: inter-paragraph spacing (default: `half`). Accepts KOMA-Script values: `false`, `true`/`full`, `half`, with optional suffixes `-`, `+`, `*` to control end-of-line fill. Do not load the `parskip` package alongside. With `half` (the default), the last line of a paragraph must leave 1 em free: a table or box of your own set exactly to `\linewidth` then overflows by 1 em; the `-` suffix (`parskip=half-`) lifts this constraint. The class commands (`\gradingstrip`, `\withqrcode`, `\splitcontent`, `\lines`) are not affected.
- **listparskip**: propagates `parskip` spacing inside lists (`itemize`, `enumerate`, `description`) for typographic consistency. Enabled by default. Use **nolistparskip** to keep lists compact regardless of `parskip`.
- **vspacing**=`factor`: vertical compression/expansion factor (default: `1.0`). Accepts values between 0.25 and 2.0.

3.4.2 *Headers and footers*

- **fullheader**: enables full header/footer (requires `\neoheader`).
- **nofooter**: removes header and footer (`empty` page style).
- **pageonlyfooter**: shows only the centered page number.
- **headerules**=`style`: rules (default: `none`). Options: `none`, `headrule`, `footrule`, `headfootrule`.

- `fancyhdr` is incompatible with the class, which relies on `scrlayer-scrpage`; use its commands (`\ihead`, `\cfoot`…).

3.4.3 *Table of contents*

- **compacttoc**: reduces spacing in the table of contents.
- **monotoc**: renders the table of contents using the primary color only.
- **twocoltoc**: displays the table of contents in two columns.

3.4.4 *Output modes*

These options let you print multiple logical pages onto a single physical sheet.

- **2a5toa4**: 2 identical A5 pages on one landscape A4 sheet.
- **2a4toa3**: 2 identical A4 pages on one landscape A3 sheet.
- **4a5toa3**: 4 identical A5 pages on one A3 sheet.
- **2toa3**: 2 different A4 pages on one landscape A3 sheet.
- **bookleta5**: A5 booklet (A5 pages on folded A4 sheets).
- **bookleta4**: A4 booklet (A4 pages on folded A3 sheets).

The three identical-copy modes require LuaLaTeX: with pdflatex or xelatex every copy rewrites the table of contents and the references, and the class warns.

3.5 Miscellaneous options

- **abstracttitle**=`Title`: title for the `abstract` environment (default: the name set by the language, "Abstract" in English).
- **inlineabstract**: places the abstract title at the start of the text, on the same line.
- **boldlistlabels**: renders list labels in bold.
- **fillable**: turns the answer areas into PDF form fields that can be filled in on screen (a `\lines` area is then no longer split across pages).
- **totalpoints**=`n`: total points for the grading scale (default: 20).

④ Document styles

4.1 Title layout (`titlelayout`)

The **titlelayout**=`style` option controls the appearance of the first page and the title.

4.1.1 *Exam styles*

- **exam**: full layout with fields for name, class, date, and a grading strip.
- **shortexam**: compact exam layout.
- **mockexam**: layout designed for mock exams.

4.1.2 *Assessment styles*

- **eval**: standard layout, information in the corners.
- **evalicons**: `eval` with customizable icons.

- **evalgrade**: `eval` with a grading strip.
- **evaliconsgrade**: combines `evalicons` and `evalgrade`.
- **shorteval**: compact single-line layout.

4.1.3 *Design styles*

- **band**
- **banner**
- **bar**
- **bauhaus**
- **blocks**
- **book**
- **bristol**
- **brush**
- **bubbles**
- **champagne**
- **circles**
- **cloud**
- **confetti**
- **flow**
- **geometric**
- **grid**
- **magazine**
- **memphis**
- **notion**
- **particles**
- **simplenotion**
- **spine**
- **stream**
- **tech**
- **wave**

4.1.4 *Classic styles*

- **default**: centered standard title.
- **titlebox**: title in a colored banner at the top of the page.
- **tighttitle**: compact title without a box.
- **onlytitle**: displays only the centered title.
- **shorttitle**: compact centered title on a single line.
- **shortlesson**: compact layout for lesson handouts.
- **minimal**: stripped-down minimalist style.
- **frame**: framed title.

4.1.5 *Inspired layouts*

- **amslike**, **mirlike**, **physlike**, **ieeelike**, **acmlike**: title pages of the profiles of the same name.
- **springerlike**: title in a gray box; **springerrule**: same title above a rule.

```
\documentclass[titlelayout=exam]{neoschool}
\neoheader{
  type = Unit Test #1,
  school = Springfield High School,
  level = AP Calculus BC,
  duration = 90 min,
  calculator = exam
}
\title{Sequences and series}
\date{October 21, 2025}
\subject{Mathematics}
\begin{document}
\maketitle
...
\end{document}
```

4.2 Header configuration (\neoheader)

This command configures the information used by the exam, eval, mockexam, shortlesson, and fullheader styles.

```
\neoheader{
  type = {Pop Quiz},
  school = {Turing Academy},
  academy = {District 12},
  level = {8th Grade},
  duration = {20 minutes},
  calculator = {false},       % true / false / exam
  leftcontent = {\faFlask},
  rightcontent = {\faCalculator},
  leftcontentfill = {true},     % true: inverted icon box
  rightcontentfill = {true}
}
```

5 Math environments

Built on tcolorbox.

5.1 Theorem styles

The **thmstyle**=style option sets the look of theorem-like environments. Options: bar, block, tile, fold, plain, frame, curve, sticker, pastel, tag (default), raw.

5.2 Available environments

- **theorem** (ref: thm)
- **lemma** (ref: lem)
- **corollary** (ref: cor)
- **conjecture** (ref: conj)
- **proposition** (ref: propo)
- **property** (ref: prop)
- **properties** (ref: prop)
- **definition** (ref: def)
- **definitions** (ref: def)
- **application** (ref: application)
- **remark**, **remarks** (unnumbered)
- **example**, **examples** (ref: example, examples)
- **proof**

New environment: \newstyletheorem, *style* among block, bar, fold, tile, plain, frame, curve, sticker, pastel, tag and raw, with six arguments: environment name, heading, colour, reference prefix, code run before the lower part, body font.

5.3 Environment options

- **title**=`text`: custom title; a bare text in brackets, `[Title]`, is accepted too.
- **label**=`name`: label for `\ref`.
- **colback**=`color`: background color.
- **colframe**=`color`: frame color.
- **coltitle**=`color`: title color.
- **fonttitle**=`commands`: title formatting.

5.4 Numbering options

- **sectionthmcounter**: resets counters at each section.
- **sharedthmcounter**: a single counter shared across all environments.
- **thmgroupcounter**: shared counter for theorem, lemma, corollary, proposition, and property.
- **sharedexcounter**: shares the counter between exercises and theorems.

5.5 Environment examples

```
\begin{definition}[
  title=Prime number,
  label=prime
]
A natural number is called prime
if it has exactly two distinct
divisors: 1 and itself.
\end{definition}

See Definition~\ref{def:prime}.
```

Definition 1 **(Prime number)** A natural number is called prime if it has exactly two distinct divisors: 1 and itself.

See Definition 1.

```
\begin{theorem}[title=Pythagorean theorem]
In a right triangle,
the square of the hypotenuse equals
the sum of the squares of the other
two sides:
\[ c^2 = a^2 + b^2 \]
\end{theorem}
```

Theorem 1 **(Pythagorean theorem)** In a right triangle, the square of the hypotenuse equals the sum of the squares of the other two sides:

$$c^2 = a^2 + b^2$$

```
\begin{property}
Every differentiable function
is continuous.
\end{property}

\begin{proof}
This follows directly from
the definition of the derivative.
\end{proof}
```

Property 1 Every differentiable function is continuous.

Proof. This follows directly from the definition of the derivative. ■

```
\begin{example}
Let $f(x) = x^2$.
Then $f'(x) = 2x$.
\end{example}

\begin{remark}
The converse is false:
$|x|$ is continuous but not
differentiable at $0$.
\end{remark}
```

Example 1. Let $f(x) = x^2$. Then $f'(x) = 2x$.

Remark 1. The converse is false: $|x|$ is continuous but not differentiable at 0.

6 Exercises

Built on the `xsim` package.

6.1 The `exercise` and `solution` environments

6.1.1 *Exercise options*

- **points**=`n`: point value.
- **bonus-points**=`n`: bonus points.
- **level**=`n`: difficulty level (1–5, shown as stars).
- **subtitle**=`text`: subtitle.
- **icon**=`name` or `\faName`: FontAwesome icon, by name (`laptop`) or by command (`\faLaptop`); requires `exerciseicons`.
- **unbreakable**: the exercise is never split across pages, whatever the `exstyle`; when it does not fit at the bottom of a page, it moves to the next one as a whole, and a printed solution stays with it.
- **topic**=`topic`: topic tag for sorting/filtering.
- **grade**=`level`: grade level.
- **subject**=`subject`: subject area.
- **ID**=`id`: identifier for `\exercisenumber{id}`.
- **template**=`name`: display style.

6.1.2 *Exercise styles (`exstyle`)*

The **exstyle**=`style` option sets the appearance of exercises.

Box styles: `block`, `capsule` (default), `capsule-outline`, `tile`, `fold`, `plain`, `frame`, `curve`, `sticker`, `pastel`, `card`, `bar`.

Badge styles: `badge`, `badge-outline`, `digit`, `digit-outline`, `digit-inline`, `digit-outline-inline`, `counter`, `counter-inline`, `counter-outline`, `counter-outline-inline`.

Line styles: `line`, `line-outline`, `line-circle`, `line-circle-outline`.

Special styles: `inline`, `shell`, `section`, `subsection`, `item`, `rule`, `separator`.

6.1.3 *Global options*

- **exerciseicons**: enables icon display.
- **answers**: shows solutions after each exercise.

- **answersonly**: shows solutions only.
- **shuffle**: randomly shuffles multiple-choice answers.
- **solstyle**=`style`: solution style (default: `inline`). Options: `inline`, `dots`, `lines`, `box`.
- **solrotate**: prints solutions upside down (180° rotation).

6.1.4 *Exercise with solution*

Nothing may follow `\begin{exercise}[...]` on the same line, as the body is read line by line; put a `\label` on the next line.

```
\begin{exercise}[
  points=4,
  level=2,
  subtitle={Finding a derivative}
]
Find the derivative of
$f(x) = x^3 - 2x + 1$.
\end{exercise}

\begin{solution}
Applying the differentiation rules:
$f'(x) = 3x^2 - 2$.
\end{solution}
```

Exercise 1 [⋆⋆] ***Finding a derivative*** **(4 points)** Find the derivative of $f(x) = x^3 - 2x + 1$.

Solution of exercise 1. Applying the differentiation rules: $f'(x) = 3x^2 - 2$.

6.1.5 *Multiple choice*

- **choices**`(n)`: single-answer multiple choice on *n* columns. `\choice` for an answer, `\choice[\correct]` for the correct one.
- **checkboxes**`(n)`: multiple-answer checkboxes. `\checkbox` for an answer, `\checkbox[\correct*]` for a correct one.

```
\begin{exercise}[points=1]
 What is the derivative of $f(x)=x^2$?
\begin{choices}(2)
  \choice[\correct] $x\mapsto 2x$
  \choice $x\mapsto x$
  \choice $x\mapsto x^2$
  \choice $x\mapsto 2$
 \end{choices}
\end{exercise}
```

Exercise 2 **(1 point)** What is the derivative of $f(x) = x^2$?

- ○ $x \mapsto 2x$
- ○ $x \mapsto x$
- ○ $x \mapsto x^2$
- ○ $x \mapsto 2$

```
\begin{exercise}[points=2]
 Check all true statements.
\begin{checkboxes}(1)
  \checkbox[\correct*] $\pi > 3$
  \checkbox $\sqrt{2}$ is rational
  \checkbox[\correct*] $0! = 1$
  \checkbox $\ln(1) = 1$
 \end{checkboxes}
\end{exercise}
```

Exercise 3 **(2 points)** Check all true statements.

- ☐ $\pi > 3$
- ☐ $\sqrt{2}$ is rational
- ☐ $0! = 1$
- ☐ $\ln(1) = 1$

7 Code listings

Two syntax highlighting backends are available via class options:

- **listings** (default): syntax highlighting via the `listings` package.
- **minted**: syntax highlighting via `minted` (requires Python, Pygments, and `--shell-escape`).

7.1 The code environment

```
\begin[options]{code}{language}[title][box-style]
... code ...
\end{code}
```

- `options`: `listings`/`minted` options.
- `language`: `python`, `latex`, `c++`, etc.
- `title`: optional title.
- `box-style`: box style override.
- `code*`: same environment without listing number (title shown as is).

```
\begin{code}{python}[Factorial function]
def fact(n):
    if n <= 1:
        return 1
    return n * fact(n - 1)
\end{code}
```

Listing 1 · Factorial function

```python
def fact(n):
    if n <= 1:
        return 1
    return n * fact(n - 1)
```

7.2 Code box styles (codestyle)

The **codestyle**=`style` option sets the appearance of code boxes. Options: `plain`, `line`, `lines`, `bar`, `frame`, `shadow` (default). `frame` is identical to `plain`.

7.3 Code options

- **codewidth**=`factor`: block width (default: 1.0).
- **centeredcode**: centers code blocks.
- **codelang**: shows the language name at the top right of each block (in the title bar when there is one); enabled by the `coder` profile, cancelled by **nocodelang**.

7.4 Additional commands

- `\codeinline[lang]{code}`: inline code with syntax highlighting.
- `\codeinput[opt]{lang}{file}[title][style]`: imports code from a file.
- `beside label` key (last optional argument of `\codeinput` and of the `code` environment): the first code line sits on the line of the preceding label, for code given as a QCM proposition (`\choice`) or as a list item; the box becomes unbreakable.

```
The \codeinline[python]{range(n)} function
generates integers from $0$ to $n-1$.
```

The `range(n)` function generates integers from 0 to $n-1$.

7.5 The pseudocode environment

Built on `algpseudocode`. With the French or German language option, keywords are automatically translated.

Special commands:

- `\Gets`: assignment arrow ←.
- `\To`: "to" keyword for loops.

```
\begin{pseudocode}{Binary search}
\Require Sorted array $T$, value $v$
\Ensure Index of $v$ or $-1$
\State $lo \Gets 0$, $hi \Gets |T| - 1$
\While{$lo \leq hi$}
    \State $mid \Gets (lo + hi) / 2$
    \If{$T[mid] = v$}
        \State \Return $mid$
    \ElsIf{$T[mid] < v$}
        \State $lo \Gets mid + 1$
    \Else
        \State $hi \Gets mid - 1$
    \EndIf
\EndWhile
\State \Return $-1$
\end{pseudocode}
```

Algorithm 1 · Binary search

Require: Sorted array T, value v
Ensure: Index of v or -1
  $lo \leftarrow 0, hi \leftarrow |T| - 1$
  while $lo \leq hi$ **do**
    $mid \leftarrow (lo + hi)/2$
    if $T[mid] = v$ **then**
      return mid
    else if $T[mid] < v$ **then**
      $lo \leftarrow mid + 1$
    else
      $hi \leftarrow mid - 1$
    end if
  end while
  return -1

8 Admonitions

Colored boxes with icons designed to draw attention to specific content.

8.1 Available environments

- **note**: general remarks ().
- **info**: supplementary information ().
- **warning**: warnings ().
- **important**: key points ().
- **tip**: tips and tricks ().
- **reminder**: things to remember ().
- **summary**: summaries ().
- **toolbox**: prerequisites and materials ().
- **method**: step-by-step methods ().
- **activity**: hands-on activities ().

8.2 Admonition styles

The **adstyle**=`style` option sets the global appearance of admonitions. Options: `modern`, `material`, `soft` (default), `classic`, `professional`, `minimal`.

8.3 Admonition options

Each environment accepts key-value options:

- **title**=`text`: custom title; a bare text in brackets, `[Title]`, is accepted too.
- **subtitle**=`text`: subtitle.
- **icon**=`\faIcon`: custom icon (command or name).
- **style**=`name`: local style (overrides the global style).

```
\begin{warning}[title=Watch out, icon=
    \faSkull]
  Don't divide by zero!
\end{warning}
\begin{tip}
  Try factoring first.
\end{tip}
```

Watch out. Don't divide by zero!

Tip. Try factoring first.

```
\begin{method}[title=Solving an equation]
  1. Isolate the variable.
  2. Simplify.
\end{method}
\begin{activity}[subtitle=Group work]
  Construct an equilateral triangle.
\end{activity}
```

Solving an equation. 1. Isolate the variable. 2. Simplify.

Activity : Group work. Construct an equilateral triangle.

9 Content layout

9.1 Absolute positioning

`\positionobject{x}{y}{scale}{content}`: places content at coordinates (x, y) from the top-left corner.

9.2 Full-width content

The `fullwidth` environment spreads its content over the whole page width in a two-column document (**twocolumn** option, `ieeelike` and `acmlike` profiles); in one column, it has no effect.

9.3 Two-column layout

`\splitcontent[w1][gap]{col1}{col2}`: splits the horizontal space.

```
\splitcontent[0.4][0.05]{%
  \textbf{Left column (40\%)}

  First paragraph...
}{%
  \textbf{Right column (55\%)}

  Second paragraph...
}
```

Left column (40%)
First paragraph with some text to illustrate the layout.

Right column (55%)
Second paragraph with additional content.

9.4 The sidebyside environment

Creates two tcolorbox boxes side by side. \tcblower separates the two halves.

```
\begin{sidebyside}[
  title=Comparison,
  righthand width=.45\linewidth
]
  \textbf{Pros}
  \begin{itemize}
    \item Simple
    \item Fast
  \end{itemize}
\tcblower
  \textbf{Cons}
  \begin{itemize}
    \item Limited
  \end{itemize}
\end{sidebyside}
```

Comparison

Pros

- Simple
- Fast

Cons

- Limited

9.5 Text with image

\textwithimage[*]{w_img}{s_img}{text}{path}: combines text and an image. * places the image on the left.

9.6 QR codes

\withqrcode[*][size]{url}{content}: QR code alongside content. * places the QR code on the right.

```
\withqrcode{https://example.com}{%
  Scan this QR code to
  visit the website.
}
```



Scan this QR code to visit the website.

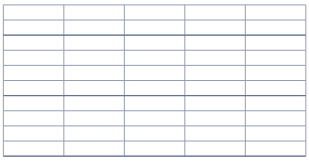
9.7 Grids and paper styles

- \grid[color]{width}{height}: 5 mm × 5 mm grid.
- \customgrid[color][dx][dy]{width}{height}: custom grid.
- \frenchgrid[minor_c][major_c]{width}{height}: Seyès (French ruled) grid.
- \gridfill / \gridfill*: fills the page with a grid.
- \notebook, \nbminorgrid, \nbmajorgrid: page background styles.

```
\grid[blue!40]{4cm}{2cm}
```



```
\frenchgrid{4cm}{2cm}
```



9.8 Simple boxes

- `neobox`: box with a frame.
- `neobox*`: box without a visible frame.
- `\neocolorbox[color]{content}`: simple colored box.
- `\inlinebox[bg][text][frame]{content}`: customizable inline box.

```
\begin{neobox}[title=My box]
  Content with a frame.
\end{neobox}

\begin{neobox*}
  Content without a visible frame.
\end{neobox*}
```

My box

Content with a frame.

Content without a visible frame.

9.9 Logos and special symbols

- `\AILogo[options]`: AI logo (chip with neural network).
- `\NoAILogo[options]`: "No AI" logo (crossed-out chip).
- `\documentcolor{color}`: changes the text color for the entire document.

```
\AILogo \quad \NoAILogo
```



10 Grading and assessment

10.1 Grading tools

- `\gradingstrip[total]`: grading banner with a score field and space for comments.
- `\mrk[*][comment]{pts}`: margin points.

```
\gradingstrip[20]
```

Mark / 20	Comments

10.2 Answer areas

- `\answerfield[width]{lines}`: answer area with a colored background.
- `\answerframe[width]{lines}`: framed answer area.
- `\vardots[length]`: dotted fill line.
- `\lines[char][spacing]{n}`: draws *n* horizontal lines.
- `\emptybox{width}{height}`: blank box for free-form answers.

```
Answer: \answerfield[5cm]{1}
```

Answer:

```
Justify:
\answerframe{3}
```

Justify:

```
Name: \vardots[4cm]

Date: \vardots[3cm]
```

Name: .....
Date: .....

```
\lines{3}
```

.....
.....
.....

With the **fillable** class option, these areas become PDF form fields that the reader fills in on screen, and `\unchecked` a check box; the page layout stays the same.

10.3 Markers and symbols

- `\cmark`: ✓ (green).
- `\xmark`: ✗ (red).
- `\unchecked`: ☐.
- `\done`: ☑.
- `\wontfix`: ☒.

```
\begin{itemize}
  \unchecked Task to do
  \done Task completed
  \wontfix Task canceled
\end{itemize}
```

- ☐ Task to do
- ☑ Task completed
- ☒ Task canceled

10.4 Competency-based assessment

`\competencies{Skill1\\Skill2...}`: assessment table with 4 proficiency levels.

```
\competencies{
  Compute derivatives \\
  Solve equations \\
  Write proofs
}
```

Competencies				
Compute derivatives				
Solve equations				
Write proofs				

11 Math commands

11.1 Highlighting

- `\mhl[color]{expr}`: highlights the expression.
- `\mc[color]{expr}`: colors the expression.
- `\mathbox<bg>[border]{content}`: frames math content.

```
$f(x) = \mhl[yellow!30]{x^2} + \mc[blue]{3x} - 1$
```

$f(x) = x^2 + 3x - 1$

```
The formula $\mathbox{E = mc^2}$ is famous.

With colors:
$\mathbox<yellow!20>[red]{a^2+b^2=c^2}$
```

The formula $E = mc^2$ is famous.
With colors: $a^2 + b^2 = c^2$

11.2 APMEP support

Commands available with the `apmep` option:

- Vectors: `\vectt{AB}`.
- Coordinate frames: `\Oij`, `\Oijk`, `\Ouv`.
- Symbols: `\euro`, `\cg`, `\cd`, `\pg`, `\pp`, `\barre{x}`.

```
The vector $\vectt{AB}$ in the frame \Oij.

We have $x \pg 0$ and $y \pp 5$.

The mean is $\barre{x} = 12$.
```

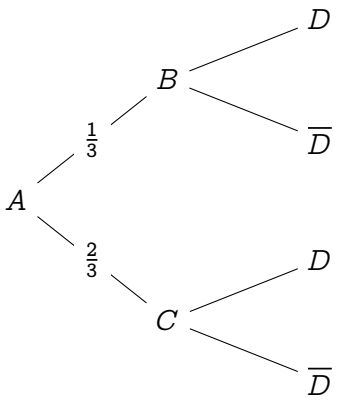
The vector $\overrightarrow{AB}$ in the frame $\left(O\,;\,\vec{\imath},\,\vec{\jmath}\right)$.
We have $x \geqslant 0$ and $y \leqslant 5$.
The mean is $\overline{x} = 12$.

12 Special tools

12.1 Trees and graphs

- **neotree**: tree environment (built on `forest`). The `w=val` option adds a weight label to a branch.
- `\neograph`: graph command (`lualatex` required).

```
\begin{neotree}[l=2cm, s sep=1cm]
  A [B, w=\frac{1}{3} [D] [\overline{D}]]
    [C, w=\frac{2}{3} [D] [\overline{D}]]
\end{neotree}
```



12.2 Math grid (mathgrid)

An environment for aligning blocks of equations in a grid.

- `\begin{mathgrid}{n}`: grid with *n* columns.
- `\neoline`: new row.
- `\neocol[span]{content}`: column with `align*`.

```
\begin{mathgrid}{2}
  \neoline
  \neocol{
    A &= 2 + 3 \\
    A &= 5
  }
  \neocol{
    B &= 4 \times 2 \\
    B &= 8
  }
\end{mathgrid}
```

$$A = 2 + 3 \qquad B = 4 \times 2$$
$$A = 5 \qquad B = 8$$

13 Margin notes

Enabled via `notes=dim`, `leftnotes=dim`, or `rightnotes=dim`.

- `\tdnote[options]{text}`: note in the margin.
- `\boxnote[label]{text}` + `\tdmark[label]`: note anchored to a specific location.

```
\documentclass[notes=2.5cm]{neoschool}

This is important\tdnote{Remember this!}.

\boxnote[hyp]{Key hypothesis}
\begin{theorem}
  \tdmark[hyp] If $f$ is continuous on $[a,b]$...
\end{theorem}
```

14 COMING FROM article

Five habits to drop, each one raising an error:

- `\usepackage[utf8]{inputenc}` and `\usepackage[french]{babel}`: the class takes care of them; the language is a class option (`french`, `english`, `german`).
- `\newtheorem{theorem}`, `{definition}`, `{lemma}`… with `amsthm`: these environments already exist; for a new type, use `\newstyletheorem` or `\newtheorem{name}{Heading}[section]` without sharing the `theorem` counter, which does not exist.
- `\institution`, `\school`: header data go through `\neoheader`.
- `\usepackage{fancyhdr}`: incompatible with `scrlayer-scrpage`, see above.
- A `\label` or any other text after `\begin{exercise}[…]` on the same line.