

Quick Start Guide to Maple *Maptools*

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This guide is intended to get you started using Maptools as quickly as possible. As such, it does not cover all of the capabilities of the package. For much more detailed information and examples, refer to the online help. To access the online help, complete step 3 below and then type at a Maple prompt: `?maptools`

1. Download and extract the "maptools" maple files and the coastal point databases to a directory on your hard drive.

- The files are archived in one zip file. Download them to a temporary directory and extract them to the desired directory using WinZip (www.winzip.com) or another similar program. (The examples below assume the files were extracted to `c:\maptools`.)

2. Start MAPLE

3. Tell MAPLE where the maptools package is on your computer by typing:

```
libname := libname, path;
```

(where *path* is the directory you extracted the files to).

- *Path* must use forward slashes and include only the directory name (do not include filenames).

example: `libname := libname, "c:/maptools";`

4. Load the maptools package in Maple by typing:

```
with(maptools);
```

5. Load a coastal point database in Maple by typing:

```
load("path");
```

(where *path* is the path to the database file you want to use).

- *Path* must use forward slashes and include the database filename and extension.

example: `load("c:/maptools/coarse.m");`

6. Define the Maple function that describes the map projection. It must be an "arrow" function with argument order (longitude, latitude) and the image must be in Cartesian coordinates.

notes:

- The argument order is (longitude, latitude). This is the reverse of the usual order.
- Within the databases, longitude and latitude are measured in the usual geographer's system, except that they are stored in radians. That is,
 - Longitude is 0 at the Prime Meridian, west is negative, and east is positive. The international dateline has longitude $\pm\pi$.
 - Latitude is $\pi/2$ at the North Pole, 0 at the equator, and $-\pi/2$ at the South Pole.

examples:

```
mercator := (lon,lat) -> (lon, ln(sec(lat)+tan(lat)));  
globe := (lon,lat) -> (cos(lon)*cos(lat), sin(lon)*cos(lat), sin(lat));
```

7. Create the plots by using the `mapplot` or `mapplot3d` function.

- The options that are supported by the `mapplot` and `mapplot3d` functions are summarized below, but for more information refer to their individual online help pages.
- The `mapplot` and `mapplot3d` functions return Maple plot structures, so you can use them in assignment statements (and later `display` them with additional plot options).

examples:

```
mapplot(mercator);  
  
mapplot3d(globe);  
  
my_globe := mapplot3d(globe):  
with(plots):  
display(my_globe, title="The Globe");
```

mapplot & mapplot3d options:

- Options are specified in the form `option=value`, and are included as arguments. A sample call is `mapplot(f, option1=value1, option2=value2, ...)`
- For more detailed information and explanation, refer to the individual online help pages on `mapplot` and `mapplot3d`.

Options	Values
coast graticule surface	ON or OFF
coast_color graticule_color surface_color	a Maple color (see <code>?plot[color]</code> to find out more)
lonlat	[minlon..maxlon, minlat..maxlat]
parallel_spacing meridian_spacing	a real number (spacing is measured in radians)

note: surface and surface_color are only supported in `mapplot3d`.