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```

```
Codeblock class: asy

    sudo-apt-get install asymptote

    See http://asymptote.sourceforge.net/

    runs:
    > asy -o <fname>.{im_fmt} {im_opt} <fname>.asy

    class->cmd
      asy -> asy
      asymptote -> asy

Metadata options
    imagine.im_out: img,fcb
    imagine.im_log: 4
```

Notes:

- `settings.outformat=<fmt>` should match `im_fmt=<fmt>`-option.
- `settings.libgs="";` stops asy from passing `--libgs` to `dvisvgm`
- `svg` format seems to create an svg file that links to a `png` image, which shows up empty in a pdf after pandoc conversion.

Aymptote logo (pdf)

Figure 1: Logo

```{.asy im_fmt="pdf" caption="Logo"}
import three;
settings.libgs="";              // workaround for how asy calls dvisvgm
settings.outformat="pdf";
settings.render=1;

size(560,320,IgnoreAspect); // Fullsize
size3(140,80,15);
currentprojection=perspective(-2,20,10,up=Y);
currentlight=White;
viewportmargin=(0,10);

real a=-0.4;
real b=0.95;
real y1=-5;
real y2=-3y1/2;
path A=(a,0){dir(10)}::{dir(89.5)}(0,y2);
path B=(0,y1){dir(88.3)}::{dir(20)}(b,0);
real c=0.5*a;
pair z=(0,2.5);
transform t=scale(1,15);
transform T=inverse(scale(t.yy,t.xx));
path[] g=shift(0,1.979)*scale(0.01)*t*
```

```
   texpath(Label("{\it symptote}",z,0.25*E+0.169S,fontsize(24pt)));
pair w=(0,1.7);
pair u=intersectionpoint(A,w-1--w);

real h=0.25*linewidth();
real hy=(T*(h,h)).x;
g.push(t*((a,hy)--(b,hy)..(b+hy,0)..(b,-hy)--(a,-hy)..(a-hy,0)..cycle));
g.push(T*((h,y1)--(h,y2)..(0,y2+h)..(-h,y2)--(-h,y1)..(0,y1-h)..cycle));
g.push(shift(0,w.y)*t*((u.x,hy)--(w.x,hy)..(w.x+hy,0)..(w.x,-hy)--(u.x,-hy)..(u.x-hy,0)..cyc
real f=0.75;
g.push(point(A,0)--shift(-f*hy,f*h)*A--point(A,1)--shift(f*hy,-f*h)*reverse(A)--cycle);
g.push(point(B,0)--shift(f*hy,-f*h)*B--point(B,1)--shift(-f*hy,f*h)*reverse(B)--cycle);

triple H=-0.1Z;
material m=material(lightgray,shininess=1.0);

for(path p : g)
  draw(extrude(p,H),m);

surface s=surface(g);
draw(s,red,nolight);
draw(shift(H)*s,m);
```
```

# Barnsley's fern (eps)



Figure 2: barnsley's fern

```{.asy im_fmt="eps" caption="barnsley's fern"}
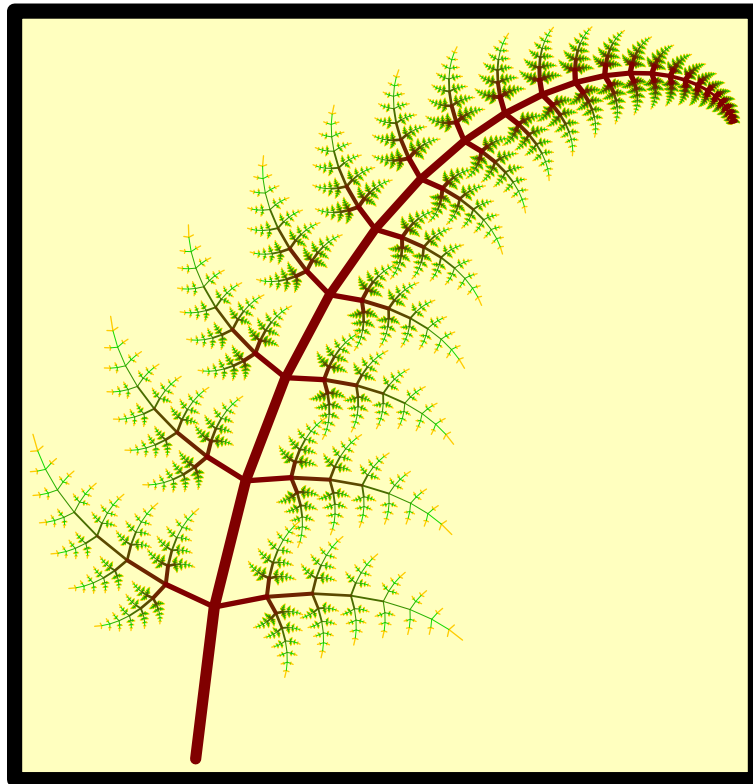// Barnsley's fern
// Fougère de Barnsley
size(10cm,0);

real ab=72, ac=-7;
real rc=0.85, rb=0.35;
path trk=(0,0)--(0,1);

transform ta=shift(0,1)*rotate(ab)*scale(rb);
transform tb=shift(0,1)*rotate(-ab)*scale(rb);
transform tc=shift(0,1)*rotate(ac)*scale(rc);
transform td=shift(0,1)*rotate((ab+ac)/2)*scale(rb);
transform te=shift(0,1)*rotate(-(ab+ac)/2)*scale(rb);

picture pic;
```

```
draw(pic,trk,red+.8green);

//Construct a fern branch as atractor
int nbit=7;
for(int i=1; i<=nbit; ++i) {
  picture pict;
  add(pict,ta*pic);
  add(pict,tb*pic);
  add(pict,tc*pic);
  draw(pict,(0,0)--(0,1), (2*(i/nbit)^2)*bp+((1-i/nbit)*green+i/nbit*brown));
  pic=pict;
}

//Use the fern branch to construct... a fern branch
picture pict;
add(pict,ta*pic);
add(pict,tb*pic);

pair x=(0,1);
nbit=23;
for(int i=1; i<=nbit; ++i) {
  add(shift(x)*rotate(ac*i)*scale(rc^i)*pict);
  draw(tc^i*((0,0)--(0,1)), 2*(1.5-i/nbit)^2*bp+brown);
  x=tc*x;
}

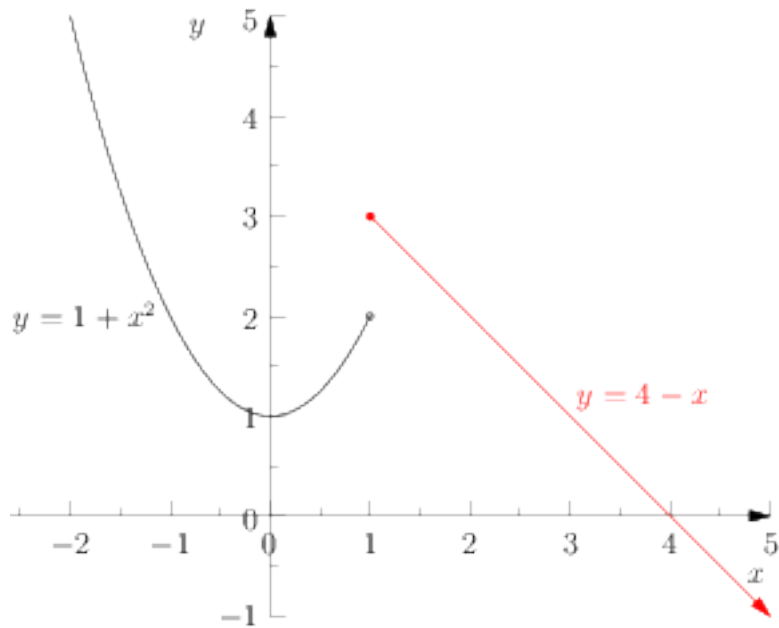shipout(bbox(3mm, 2mm+black, FillDraw(paleyellow)));
```

2D example (png)

Figure 3: Created by Asymptote

```{.asy caption="Created by Asymptote"}
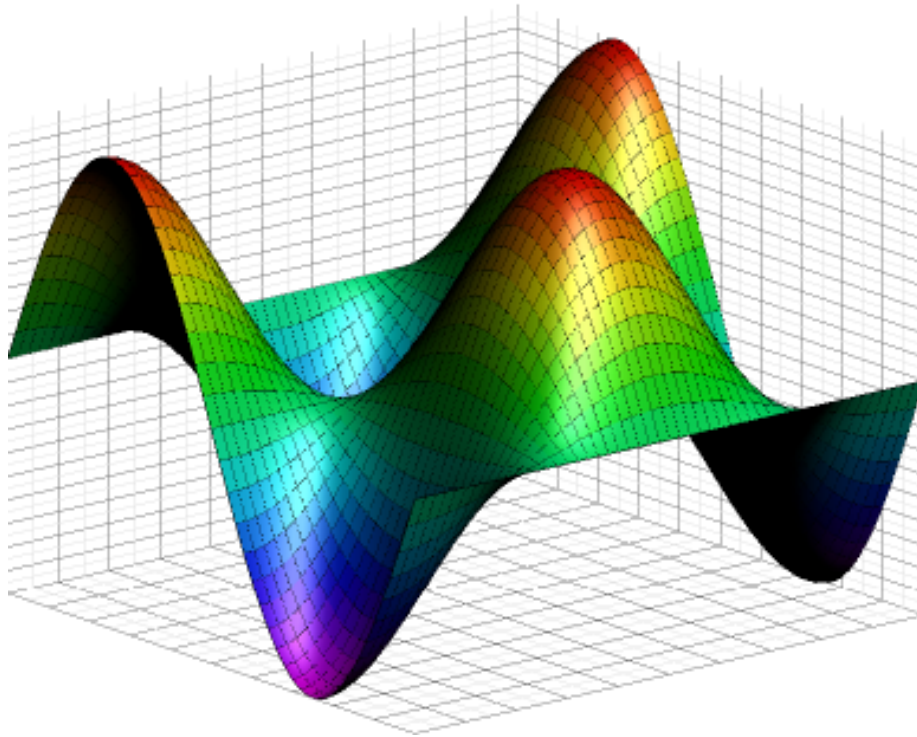settings.outformat="png";
//settings.prc=false;
//settings.render=0;

import graph;
size(4inches,0);

real f1(real x) {return (1+x^2);}
real f2(real x) {return (4-x);}
xaxis("$x$",LeftTicks,Arrow);
yaxis("$y$",RightTicks,Arrow);
draw("$y=1+x^2$",graph(f1,-2,1));
dot((1,f1(1)),UnFill);
draw("$y=4-x$",graph(f2,1,5),LeftSide,red,Arrow);
dot((1,f2(1)),red);
```

3D example (png)


````asy
settings.outformat="png";   // im_fmt="png" by default

import graph3;
import grid3;
import palette;

currentprojection=orthographic(0.8,1,1);
size(400,300,IgnoreAspect);
defaultrender.merge=true;
real f(pair z) {return cos(2*pi*z.x)*sin(2*pi*z.y);}
surface s=surface(f,(-1/2,-1/2),(1/2,1/2),50,Spline);
draw(s,mean(palette(s.map(zpart),Rainbow(40))),black);
grid3(XYZgrid);
````

7

Documentation

asy -h

```
Asymptote version 2.41 [(C) 2004 Andy Hammerlindl, John C. Bowman, Tom Prince]
http://asymptote.sourceforge.net/
Usage: asy [options] [file ...]

Options (negate by replacing - with -no):

-V,-View              View output; command-line only
-a,-align C|B|T|Z     Center, Bottom, Top, or Zero page alignment [C]
-aligndir pair        Directional page alignment (overrides align) [(0,0)]
-antialias n          Antialiasing width for rasterized output [2]
-arcballradius pixels Arcball radius [750]
-auto3D               Automatically activate 3D scene [true]
-autobillboard        3D labels always face viewer by default [true]
-autoimport string    Module to automatically import
-autoplain            Enable automatic importing of plain [true]
-autoplay             Autoplay 3D animations [false]
-autorotate           Enable automatic PDF page rotation [false]
-axes3                Show 3D axes in PDF output [true]
-batchMask            Mask fpu exceptions in batch mode [false]
-batchView            View output in batch mode [false]
-bw                   Convert all colors to black and white [false]
-cd directory         Set current directory; command-line only
-cmyk                 Convert rgb colors to cmyk [false]
-c,-command string    Command to autoexecute
-compact              Conserve memory at the expense of speed [false]
-d,-debug             Enable debugging messages [false]
-divisor n            Garbage collect using purge(divisor=n) [2]
-doubleclick ms       Emulated double-click timeout [200]
-embed                Embed rendered preview image [true]
-exitonEOF            Exit interactive mode on EOF [true]
-fitscreen            Fit rendered image to screen [true]
-framedelay ms        Additional frame delay [0]
-framerate frames/s   Animation speed [30]
-globalwrite          Allow write to other directory [false]
-gray                 Convert all colors to grayscale [false]
-h,-help              Show summary of options; command-line only
-historylines n       Retain n lines of history [1000]
-iconify              Iconify rendering window [false]
-inlineimage          Generate inline embedded image [false]
-inlinetex            Generate inline TeX code [false]
-interactiveMask      Mask fpu exceptions in interactive mode [true]
```

```
-interactiveView      View output in interactive mode [true]
-interactiveWrite     Write expressions entered at the prompt to stdout [true]
-k,-keep              Keep intermediate files [false]
-keepaux              Keep intermediate LaTeX .aux files [false]
-level n              Postscript level [3]
-l,-listvariables     List available global functions and variables [false]
-localhistory         Use a local interactive history file [false]
-loop                 Loop 3D animations [false]
-m,-mask              Mask fpu exceptions; command-line only
-maxtile pair         Maximum rendering tile size [(1024,768)]
-maxviewport pair     Maximum viewport size [(2048,2048)]
-multiline            Input code over multiple lines at the prompt [false]
-multipleView         View output from multiple batch-mode files [false]
-multisample n        Multisampling width for screen images [4]
-offscreen            Use offscreen rendering [false]
-O,-offset pair       PostScript offset [(0,0)]
-f,-outformat format  Convert each output file to specified format
-o,-outname name      Alternative output directory/filename
-p,-parseonly         Parse file [false]
-pdfreload            Automatically reload document in pdfviewer [false]
-pdfreloaddelay usec  Delay before attempting initial pdf reload [750000]
-position pair        Initial 3D rendering screen position [(0,0)]
-prc                  Embed 3D PRC graphics in PDF output [true]
-prompt string        Prompt [> ]
-prompt2 string       Continuation prompt for multiline input  [..]
-q,-quiet             Suppress welcome text and noninteractive stdout [false]
-render n             Render 3D graphics using n pixels per bp (-1=auto) [-1]
-resizestep step      Resize step [1.2]
-reverse              reverse 3D animations [false]
-rgb                  Convert cmyk colors to rgb [false]
-safe                 Disable system call [true]
-scroll n             Scroll standard output n lines at a time [0]
-spinstep deg/s       Spin speed [60]
-svgemulation         Emulate unimplemented SVG shading [false]
-tabcompletion        Interactive prompt auto-completion [true]
-tex engine           latex|pdflatex|xelatex|lualatex|tex|pdftex|luatex|context|none [latex
-thick                Render thick 3D lines [true]
-thin                 Render thin 3D lines [true]
-threads              Use POSIX threads for 3D rendering [true]
-toolbar              Show 3D toolbar in PDF output [true]
-s,-translate         Show translated virtual machine code [false]
-twice                Run LaTeX twice (to resolve references) [false]
-twosided             Use two-sided 3D lighting model for rendering [true]
-u,-user string       General purpose user string
-v,-verbose           Increase verbosity level (can specify multiple times) [0]
-version              Show version; command-line only
```

```
-wait                   Wait for child processes to finish before exiting [false]
-warn string            Enable warning; command-line only
-where                  Show where listed variables are declared [false]
-zoomfactor factor      Zoom step factor [1.05]
-zoomstep step          Mouse motion zoom step [0.1]
```

man page

ASY(1)   General Commands Manual   ASY(1)

NAME
       asy - Asymptote: a script-based vector graphics language

SYNOPSIS
       asy [options] [file ...]

DESCRIPTION
       Asymptote is a powerful descriptive vector graphics language for
       technical drawings, inspired by MetaPost but with an improved
       C++-like syntax.   Asymptote provides for figures the same high-
       quality level of typesetting that LaTeX does for scientific text.

OPTIONS
       If no arguments are given, Asymptote runs in interactive mode.

       If "-" is given as the file argument, Asymptote reads from stan-
       dard input.

       A summary of options is included below. The effect of most options
       can be negated by prepending no to the option name. Default val-
       ues for most options may also be entered in the file .asy/con-
       fig.asy in the user's home directory using the long form:

            import settings;
            batchView=true;

       For a complete description, see the Info files.

       -V,-View
            View output; command-line only.

       -a,-align C|B|T|Z
            Center, Bottom, Top, or Zero page alignment [C].
```

```
-aligndir pair
        Directional page alignment (overrides align) [(0,0)].

-antialias n
        Antialiasing width for rasterized output [2].

-arcballradius pixels
        Arcball radius [750].

-auto3D
        Automatically activate 3D scene [true].

-autobillboard
        3D labels always face viewer by default [true].

-autoimport string
        Module to automatically import.

-autoplain
        Enable automatic importing of plain [true].

-autoplay
        Autoplay 3D animations [false].

-autorotate
        Enable automatic PDF page rotation [false].

-axes3 Show 3D axes in PDF output [true].

-batchMask
        Mask fpu exceptions in batch mode [false].

-batchView
        View output in batch mode [false].

-bw     Convert all colors to black and white [false].

-cd directory
        Set current directory; command-line only.

-cmyk   Convert rgb colors to cmyk [false].

-c,-command string
        Command to autoexecute.

-compact
```

```
        Conserve memory at the expense of speed [false].

-d,-debug
        Enable debugging messages [false].

-divisor n
        Garbage collect using purge(divisor=n) [2].

-doubleclick ms
        Emulated double-click timeout [200].

-embed Embed rendered preview image [true].

-exitonEOF
        Exit interactive mode on EOF [true].

-fitscreen
        Fit rendered image to screen [true].

-framedelay ms
        Additional frame delay [0].

-framerate frames/s
        Animation speed [30].

-globalwrite
        Allow write to other directory [false].

-gray  Convert all colors to grayscale [false].

-h,-help
        Show summary of options; command-line only.

-historylines n
        Retain n lines of history [1000].

-iconify
        Iconify rendering window [false].

-inlineimage
        Generate inline embedded image [false].

-inlinetex
        Generate inline TeX code [false].

-interactiveMask
```

Mask fpu exceptions in interactive mode [true].

-interactiveView
        View output in interactive mode [true].

-interactiveWrite
        Write expressions entered at the prompt to stdout [true].

-k,-keep
        Keep intermediate files [false].

-keepaux
        Keep intermediate LaTeX .aux files [false].

-level n
        Postscript level [3].

-l,-listvariables
        List available global functions and variables [false].

-localhistory
        Use a local interactive history file [false].

-loop Loop 3D animations [false].

-m,-mask
        Mask fpu exceptions; command-line only.

-maxtile pair
        Maximum rendering tile size [(1024,768)].

-maxviewport pair
        Maximum viewport size [(2048,2048)].

-multiline
        Input code over multiple lines at the prompt [false].

-multipleView
        View output from multiple batch-mode files [false].

-multisample n
        Multisampling width for screen images [4].

-offscreen
        Use offscreen rendering [false].

```
-O,-offset pair
      PostScript offset [(0,0)].

-f,-outformat format
      Convert each output file to specified format.

-o,-outname name
      Alternative output directory/filename.

-p,-parseonly
      Parse file [false].

-pdfreload
      Automatically reload document in pdfviewer [false].

-pdfreloaddelay usec
      Delay before attempting initial pdf reload [750000].

-position pair
      Initial 3D rendering screen position [(0,0)].

-prc  Embed 3D PRC graphics in PDF output [true].

-prompt string
      Prompt [> ].

-prompt2 string
      Continuation prompt for multiline input  [..].

-q,-quiet
      Suppress welcome text and noninteractive stdout [false].

-render n
      Render 3D graphics using n pixels per bp (-1=auto) [-1].

-resizestep step
      Resize step [1.2].

-reverse
      reverse 3D animations [false].

-rgb  Convert cmyk colors to rgb [false].

-safe  Disable system call [true].

-scroll n
```

Scroll standard output n lines at a time [0].

-spinstep deg/s
        Spin speed [60].

-svgemulation
        Emulate unimplemented SVG shading [false].

-tabcompletion
        Interactive prompt auto-completion [true].

-tex engine
        latex|pdflatex|xelatex|lualatex|tex|pdftex|luatex|con-
        text|none [latex].

-thick Render thick 3D lines [true].

-thin Render thin 3D lines [true].

-threads
        Use POSIX threads for 3D rendering [true].

-toolbar
        Show 3D toolbar in PDF output [true].

-s,-translate
        Show translated virtual machine code [false].

-twice Run LaTeX twice (to resolve references) [false].

-twosided
        Use two-sided 3D lighting model for rendering [true].

-u,-user string
        General purpose user string.

-v,-verbose
        Increase verbosity level (can specify multiple times) [0].

-version
        Show version; command-line only.

-wait Wait for child processes to finish before exiting [false].

-warn string
        Enable warning; command-line only.

```
       -where Show where listed variables are declared [false].

       -zoomfactor factor
              Zoom step factor [1.05].

       -zoomstep step
              Mouse motion zoom step [0.1].

SEE ALSO
       Asymptote  is  documented  fully  in the asymptote Info page.  The
       manual can also be accessed in interactive mode  with  the  "help"
       command.

AUTHOR
       Asymptote  was  written  by Andy Hammerlindl, John Bowman, and Tom
       Prince.

       This manual page was written by Hubert Chan for the Debian project
       (but may be used by others).
```