Asymptote Reference Card

Program structure/functions

import "filename"
import "filename" as name
include "filename"

import module
import "filename" as name
import filename as module name

include "filename"
include verbatim text from file

type f(type,...);
optional function declaration

type name;
variable declaration

type f(type arg,...) {
function definition

statements
return value;
}

Data types/declarations

boolean (true or false)
true or false

tri-state boolean (true, default, or false)
true, default, or false

integer
int

float (double precision)
real

ordered pair (complex number)
pair

color, line type/width/cap, font, fill rule
guide

character string
string

fixed piecewise cubic Bezier spline
path

unresolved piecewise cubic Bezier spline
guide

3D data types (import three;)
ordered triple
triple

3D path
path3

3D guide
guide3

3D affine transform
transform3

Constants

exponential form
6.02e23

TEX string constant
"abc\ de"

TEX strings: special characters
\\, \-

C strings: constant
'abc\ de'

C strings: special characters
\\, \" \' \?

C strings: newline, cr, tab, backspace
\n \r \t \b

C strings: octal, hexadecimal bytes
\0-\377 \x0-\xFF

Operators

arithmetic operations
+ - * /
%
== != > >= < <= !
& & | |
(type) expr
++ --
+= -= /= %=
expr1 ? expr2 : expr3
name.member
,

Flow control

statement terminator
;

block delimiters
{
}

comment delimiters
/* */

comment to end of line delimiter
//

exit from while/do/for
break;
continue;
return expr;
exit();

terminate execution
abort(string);

Flow constructions (if/while/for/do)

if(expr) statement
else if(expr) statement
else statement

while(expr)
statement

for(expr1; expr2; expr3)
statement

for(type var : array)
statement

do statement
while(expr);

3D affine transform
Arrays
array
array element i
array indexed by elements of int array A
array of anonymous array
array containing n deep copies of x length
cyclic flag
pop element x
push element x
append array a
insert rest arguments at index i
delete element at index i
delete elements with indices in [i,j]
delete all elements
test whether element n is initialized
array of indices of initialized elements
complement of int array in \(0, \ldots, n-1\)
deep copy of array a
array \{0,1,\ldots,n-1\}
array \{n,n+1,\ldots,m\}
array \{n-1,n-2,\ldots,0\}
array \{f(0),f(1),\ldots,f(n-1)\}
array obtained by applying f to array a uniform partition of [a,b] into n intervals
concat specified 1D arrays
return sorted array
return array sorted using less search sorted array a for key
index of first true value of bool array a
index of nth true value of bool array a

Initialization
initialize variable
initialize array
path connectors
straight segment
Bezier segment with implicit control points
concatenate
lift pen
..tension atleast 1..
..tension atleast infinity..
Labels
implicit cast of string s to Label
Label a with relative position and alignment
Label a with absolute position and alignment
Label a with specified pen
draw commands
draw path with current pen
draw path with pen
draw labeled path
draw arrow with pen
draw path on picture
draw visible portion of line through two pairs

type [] name;
  type[1] name[1];
n = 1
n = A
new type [dim]
array(n,x)
array.length
array.cyclic
name.pop()
name.push(x)
name.append(a)
insert(1,...)
name.delete(i)
name.delete(i,j)
name.delete()
name.initialize(n)
name.keys
complement(a,n)
copy(a)
sequence(n,m)
reverse(n)
sequence(f,n)
map(f,a)
uniform(a,b,n)
concat(a,b,...)
sort(a)
sort(a,less)
search(a,key)
find(a)
find(a,n)
fill commands
fill path with current pen
fill path with pen
fill path on picture
label commands
label a pair with optional alignment z
label a path with optional alignment z
add label to picture
clip commands
clip to path
clip to path with fill rule
clip picture to path
pens
Grayscale pen from value in [0,1]
RGB pen from values in [0,1]
CMYK pen from values in [0,1]
RGB pen from heximdecimal string
heximdecimal string from rgb pen
hsv pen from values in [0,1]
invisible pen
default pen
current pen
solid pen
dotted pen
wide dotted current pen
wide dotted pen
dashed pen
long dashed pen
dash dotted pen
long dash dotted pen
PostScript butt line cap
PostScript round line cap
PostScript projecting square line cap
miter join
round join
bevel join
pen with miter limit
zero-winding fill rule
even-odd fill rule
align to character bounding box (default)
align to \(\text{TikZ}\) baseline
pen with font size (pt)
\(\text{TikZ}\) pen from encoding,family,series,shape
\(\text{TikZ}\) pen
scaled \(\text{TikZ}\) pen
PostScript font from strings
pen with opacity in [0,1]
construct pen nib from polygonal path
pen mixing operator
path operations

number of segments in path p
number of nodes in path p
is path p cyclic?

is segment i of path p straight?
is path p straight?
coordinates of path p at time t
direction of path p at time t
direction of path p at length(p)
unit(dir(p))+dir(q))
acceleration of path p at time t
radius of curvature of path p at time t
precontrol point of path p at time t
postcontrol point of path p at time t
arc length of path p
time at which arclength(p)=L
point on path p at arclength L
first value t at which dir(p,t)=z
time t at relative fraction l of arclength(p)
point at relative fraction l of arclength(p)
point midway along arclength of p
p path running backwards along p
subpath of p between times a and b
times for one intersection of paths p and q
times at which p reaches minimal extents
times at which p reaches maximal extents
intersection times of paths p and q
intersection times of path p with "--a--b--'
intersection times of path p crossing x=x
intersection times of path p crossing y=y
intersection point of paths p and q
intersection points of p and q
intersection of extension of P--Q and p--q
lower left point of bounding box of path p
upper right point of bounding box of path p
subpaths of p split by nth cut of knife
winding number of path p about pair z
pair z lies within path p'
pair z lies within or on path p'
path surrounding region bounded by paths
path filled by draw(g,p)
unit square with lower-left vertex at origin
unit circle centered at origin
circle of radius r about c
arc of radius r about c from angle a to b
unit n-sided polygon
unit n-point cyclic cross

pictures

add picture pic to current picture
add picture pic about pair z

length(p)
size(p)
cyclic(p)
straight(p,i)
piecewisestraight(p)
point(p,t)
dir(p,t)
dir(p,q)
accel(p,t)
radius(p,t)
precontrol(p,t)
postcontrol(p,t)
arc length(p)
arctime(p,L)
arcpoint(p,L)
dirtime(p,z)
reltime(p,l)
relpoint(p,l)
midpoint(p)
reverse(p)
subpath(p,a,b)
intersect(p,q)
mintimes(p)
maxtimes(p)
intersections(p,q)
times(p,x)
times(p,z)
interceptionpoint(p,q)
intersectionpoints(p,q)
extension(P,Q,p,q)
min(p)
max(p)
cut(p,knife,n)
intersectionnumber(p,z)
interior(p,z)
inside(p,z)
bendpointcycle(...)
strokepath(g,p)
unitsquare
unitcircle
circle(c,r)
arc(c,r,a,b)
polygon(n)
cross(n)

affine transforms

identity transform
shift by values
shift by pair
scale by x in the x direction
scale by y in the y direction
scale by x in both directions
scale by real values x and y
map (x,y) → (x+sx,y)
rotate by real angle in degrees about pair z
reflect about line from P--Q

string operations

concatenate operator
string length
position ≥ pos of first occurrence of t in s
position ≤ pos of last occurrence of t in s
string with t inserted in s at pos
string s with n characters at pos erased
substring of string s of length n at pos
string s reversed
string s with before changed to after
string a translated via {{before,after},...}
format x using C-style format string s
casts hexadecimal string to an integer
casts x to string using precision digits
current time formatted by format
time in seconds of string s using format
string corresponding to seconds using format
split s into strings separated by delimiter

add(pic)
add(pic,z)

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