

Asymptote

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Asymptote : The Vector Graphics Language

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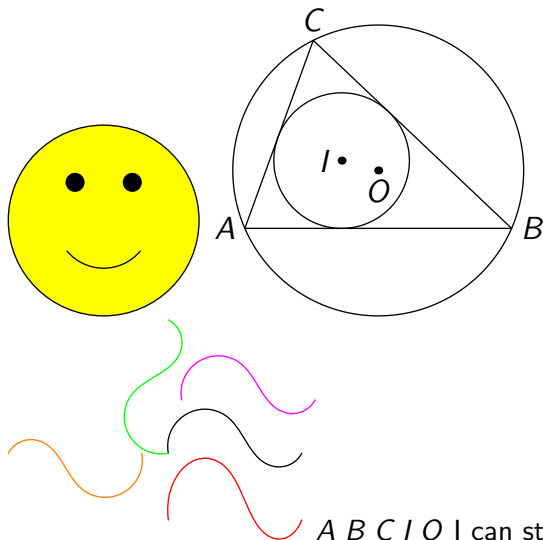
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- Asymptote is a programming language; it has a much cleaner, powerful syntax and float-point numerics
- Asymptote figures can easily be embeded into LaTeX documents, with same styling.

Examples of figures drawn by Asymptote



A B C I O I can still type my normal
 LaTeX stuff around it: $\int_0^\pi \sin x \, dx = 2$

Installing asymptote

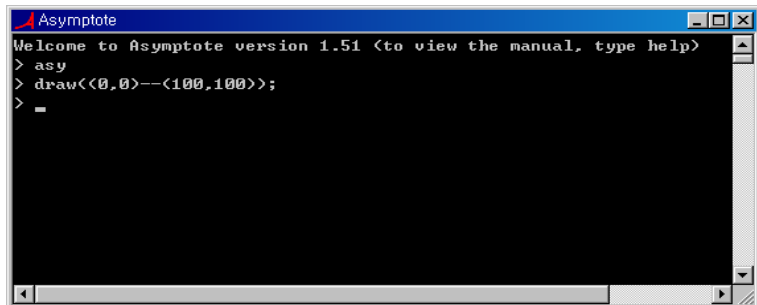
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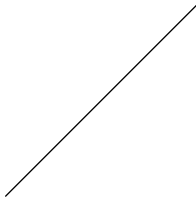
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```
Asymptote
Welcome to Asymptote version 1.51 <to view the manual, type help>
> asy
> draw<<0,0>--<100,100>>;
> _
```

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Running Asymptote on LaTeX

- Create a folder named “asymptote” at `C:\Program Files\MiKTeX 2.x\tex\latex` or wherever you installed MiKTeX

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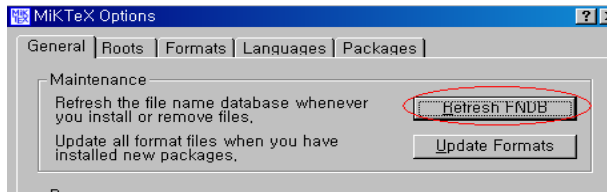
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- Click “Refresh FNDB”



Compiling Asymptote on LaTeX-1

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- Type

```
\usepackage[inline]{asymptote}
...
\begin{asy}
include graph;
size(1inch);
filldraw(circle((0,0),1),yellow,black);
fill(circle((-0.3,.4),.1),black);
fill(circle((0.3,.4),.1),black);
draw(arc((0,0),.5,-140,-40));
\end{asy}
```

and compile the document.

Compiling Asymptote on LaTeX-1

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and compile the document. **And all you get is a blank space :P**

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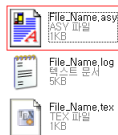


Compiling Asymptote on LaTeX-2

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run “File_Name.asy”



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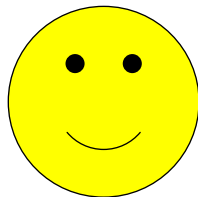
run "File_Name.asy"



then compile again



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\begin{asy}  
include graph;  
size(1inch);  
filldraw(circle((0,0),1),yellow,black);  
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draw(arc((0,0),0.5,-140,-40));  
\end{asy}
```



Variables

- `bool a = true;`
- `string b = "Hellow world!";`
- `int n = 1;`
- `real r = 1.234;`
- `pair p = (2,0);`
- `triple t = (1,2,3);`
- `path q = (0,0)--(1,1);`
- `transform tt = rotate(90);`
- `picture , pen`

Basic Functions

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- `dir(30); , expi(30);`
- `tf = shift(sqrt(3)/6*dir(30));, rotate(180,(-5,0));`

Basic Functions

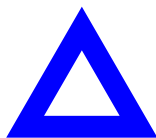
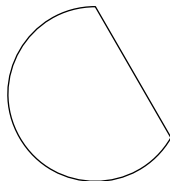
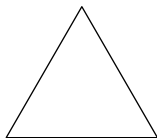
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- `dir(30); , expi(30);`
- `tf = shift(sqrt(3)/6*dir(30));, rotate(180,(-5,0));`
- `draw(T);, fill(T,blue);`

Basic Syntax

- ```

unitsize(1inch);
path T,ct,tt;
T=(0,0)--(1,0)--(1/2,sqrt(3)/2)--cycle;
ct=(0,0)..(1,0)--(1/2,sqrt(3)/2)..cycle;
tt=shift(sqrt(3)/6*dir(30))*(scale(1/2)*T);
draw(T);
draw(shift(2*right)*ct);
fill(reverse(shift(4*right)*tt)^(shift(4*right)*T),blue);

```



# What is a package?

- You can define a new function of your own! for example

```
pair newfunction(pair z, real r=0)
{
 real a,b;
 a=z.x;
 b=z.y;
 return (a+r,b+r);
}
```

# What is a package?

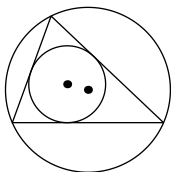
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pair newfunction(pair z, real r=0)
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 return (a+r,b+r);
}
```

- Asymptote comes with various packages which contain many useful functions. For example

```
import graph;
Circle(pair p, real r, int n=400);
```

## Example : The Olympiad Package



```

import olympiad;
unitsize(0.5cm);
pair A,B,C,O,I;
A=origin; B=2*right; C=1.5*dir(70);
O=circumcenter(A,B,C); // olympiad - circumcenter
I=incenter(A,B,C); // olympiad - incenter
draw(A--B--C--cycle);
dot(O); dot(I);
draw(circumcircle(A,B,C)); // olympiad - circumcircle
draw(incircle(A,B,C)); // olympiad - incircle

```