Tutorial 30: Creating graphical drawings using point, lines, surfaces, frames etc.

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Complete List of all Tutorials with Publishable MATLAB Files of this Solid-Geoemtries Toolbox

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Motivation for this tutorial: (Originally SolidGeometry 3.4 required)

In this tutorial, features are introduced that allow you to create drawings for the descriptive geometry using Matlab. The goal is to display lines, planes, spaces and polygons, surfaces and surface-bounded volumes and to label them mathematically (Tex-style). some functions are based in individual points such as:

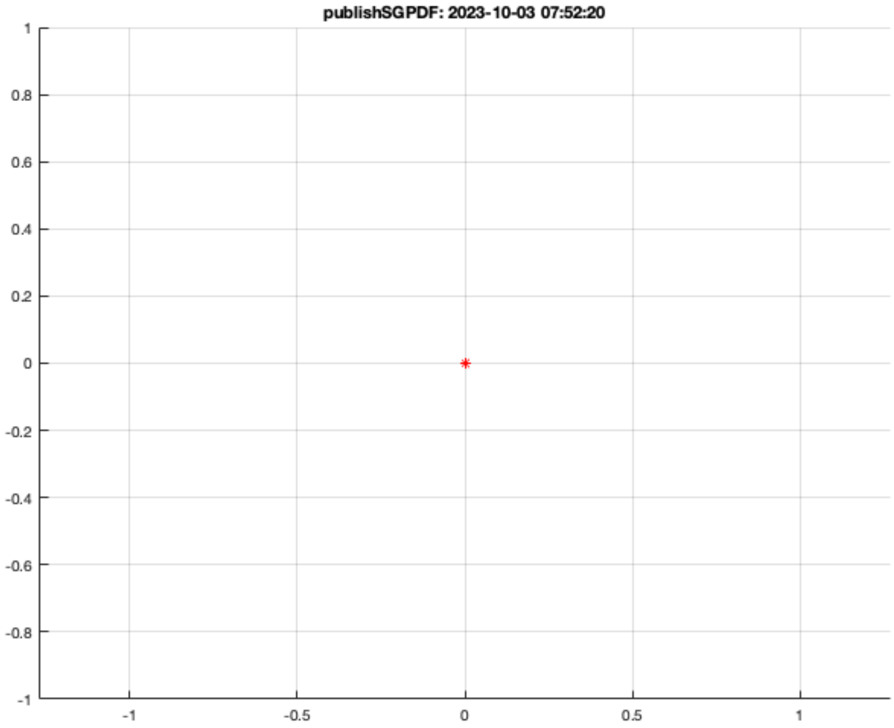
- pplot - plot a point in defined color, shape and size
- lplot - plot a line between two points with color, width, tip, start point end point
- aplot - plot an angle at a point using a line and a second line or angle
- slplot - plot a staight line using a start point and direction vector
- tplot;
- tfplot; some functions are based on point lists (PL) or vertex lists (VL), such as: PLplot, VLplot,

1. Plotting points (PL) and vertices (3D)

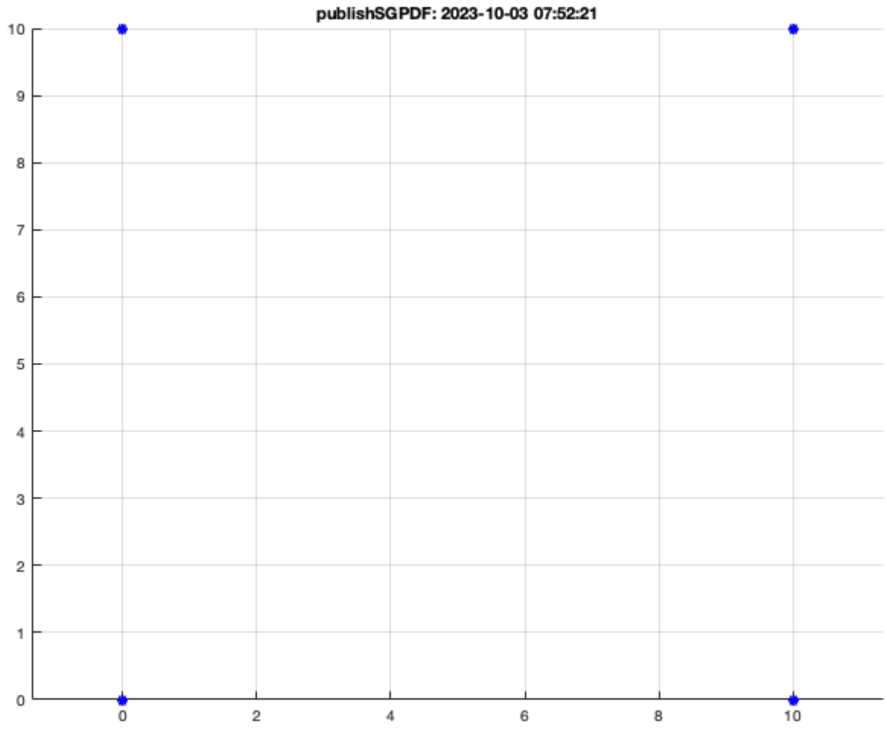
```
p=[0 0]      % row style
p=[0;0]      % column style
v=[0 0 0]  % row style
v=[0; 0; 0]  % column style


SGfigure; pplot(p);
```

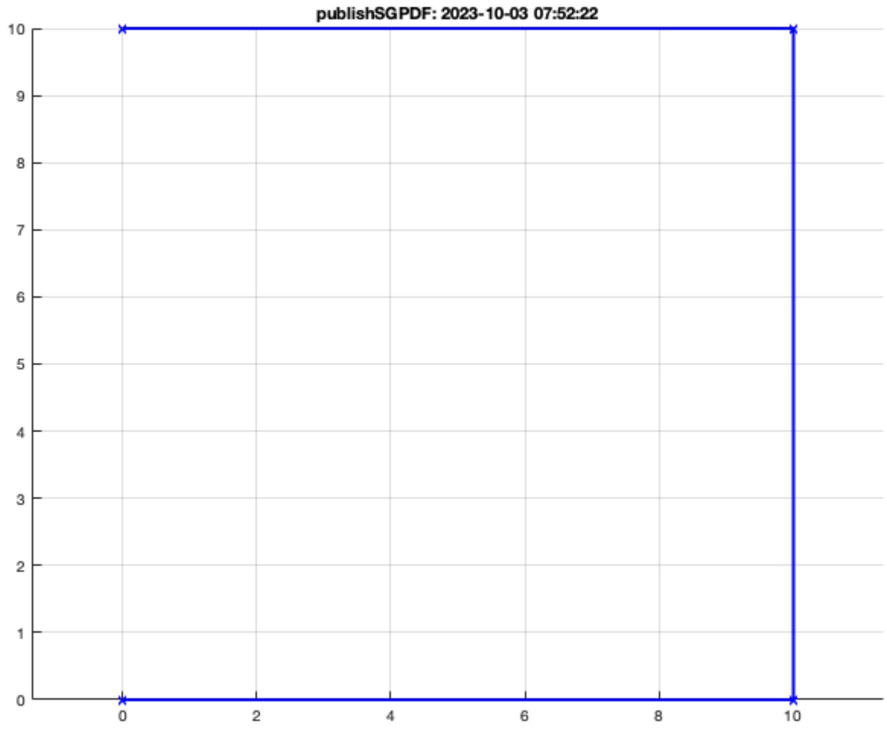
```
p =
     0     0
p =
     0
     0
v =
     0     0     0
v =
     0
     0
     0
```



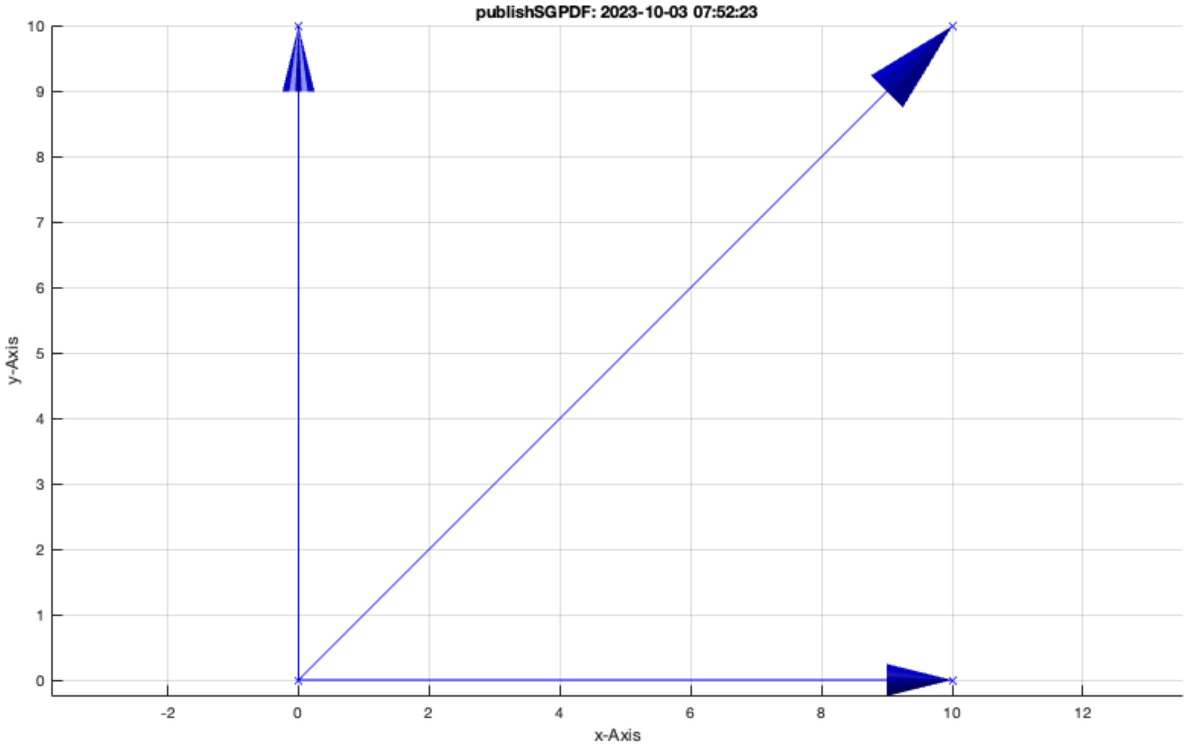
```
SGfigure; PLplot([0 0;10 0;10 10; 0 10],'b*',2);            % point plot of point list
```



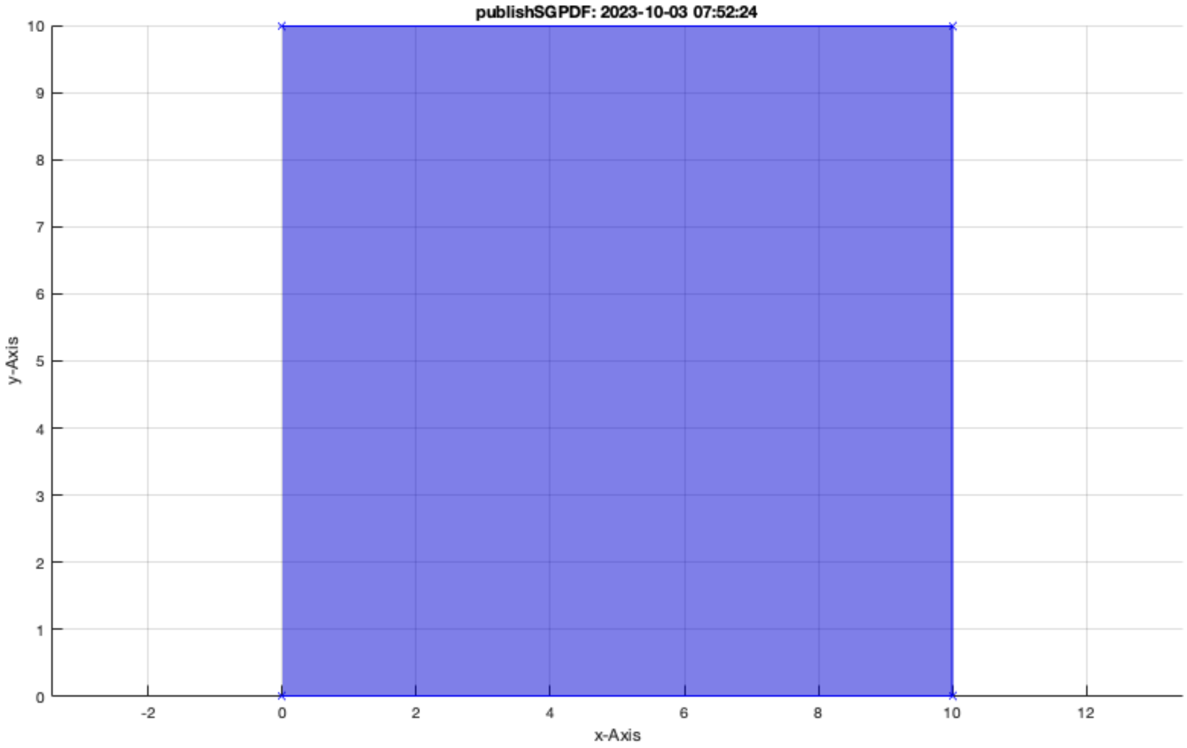
```
SGfigure; PLplot([0 0;10 0;10 10; 0 10],'bx-',2);          % Line plot of point list
```



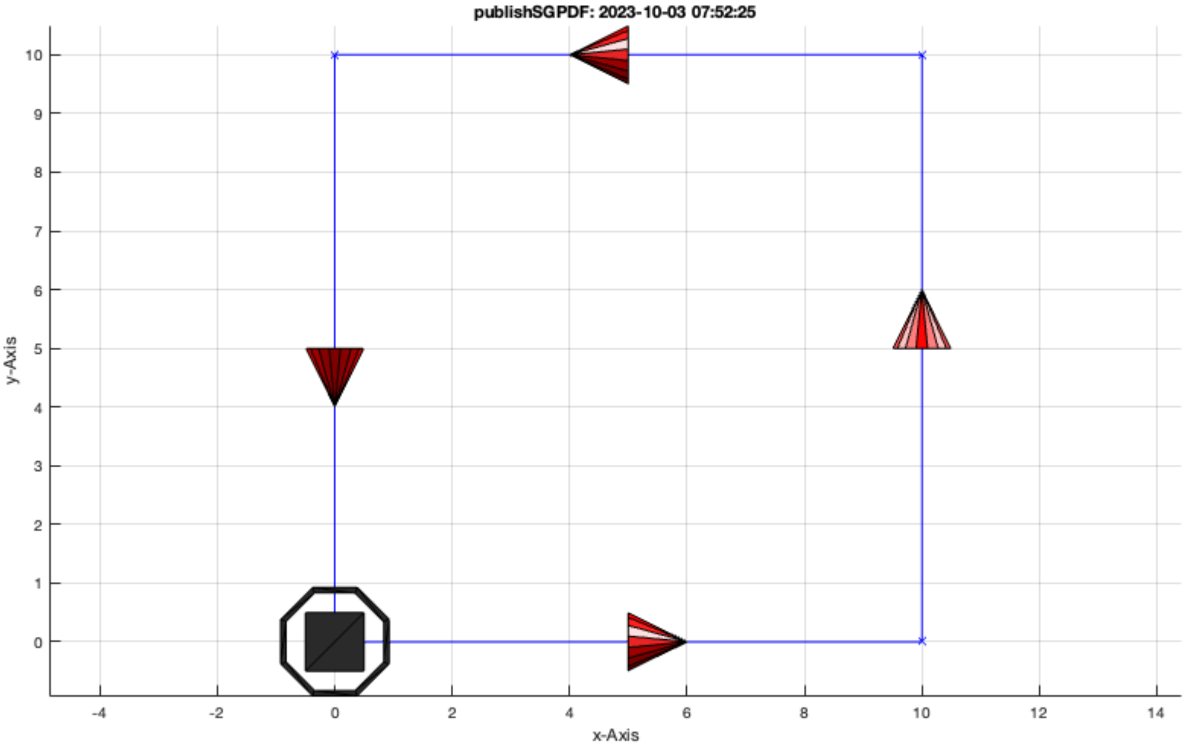
```
SGfigure; PLplot([0 0;10 0;10 10; 0 10],'bx-',1,1);          % Vector plot of point list
```



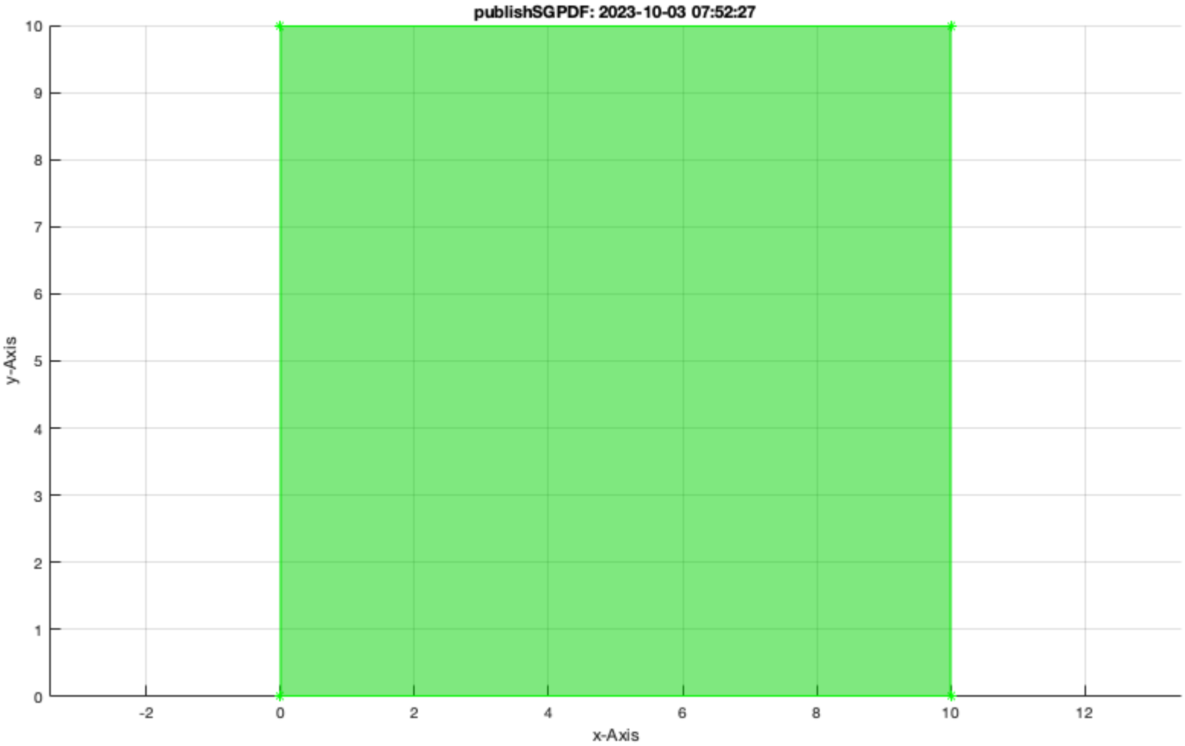
```
SGfigure; PLplot([0 0;10 0;10 10; 0 10],'bx-',1,'',0.5);    % Surface enlosed by point list
```



```
SGfigure; CPLplot([0 0;10 0;10 10; 0 10],'bx-',1,1,1,1);    % Plotting closed polygon
```

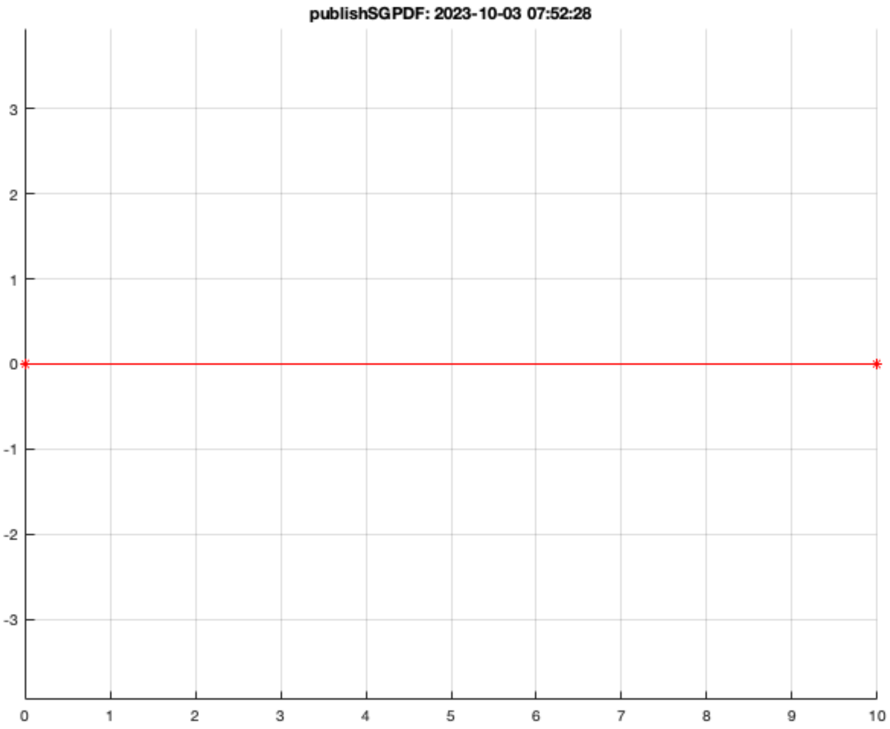


```
SGfigure; CPLfaceplot([0 0;10 0;10 10; 0 10],'g*-',1,0.5);  % Plotting closed polygon surfaces
```

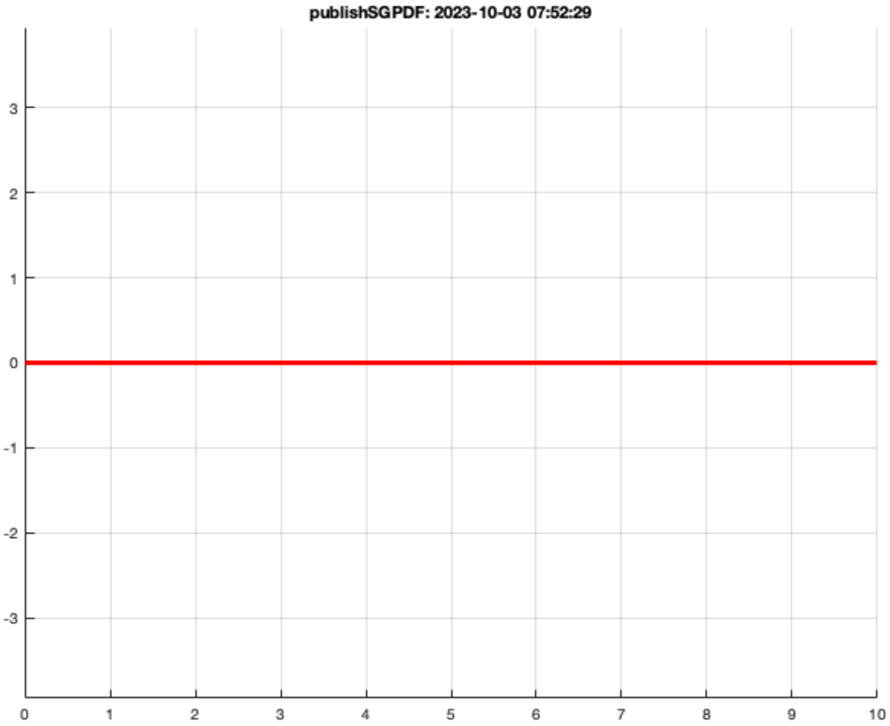


2. Plotting lines

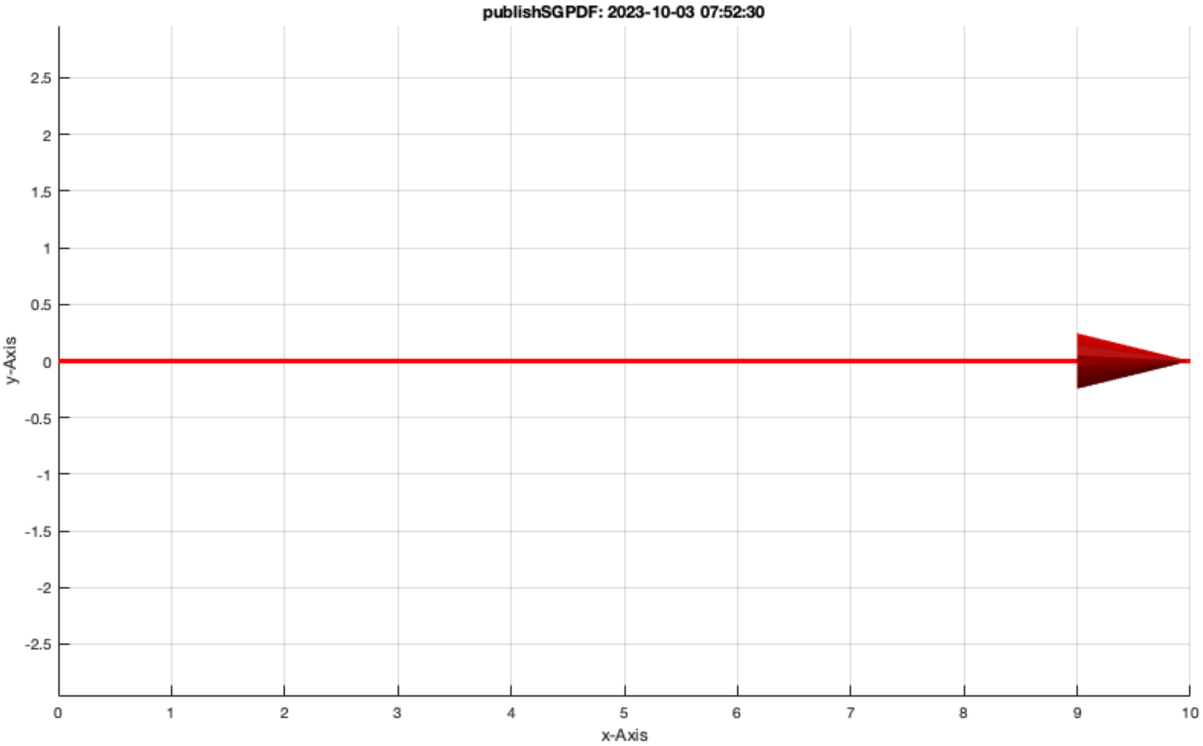
```
SGfigure; lplot([0 0],[10 0],'r*-');
```



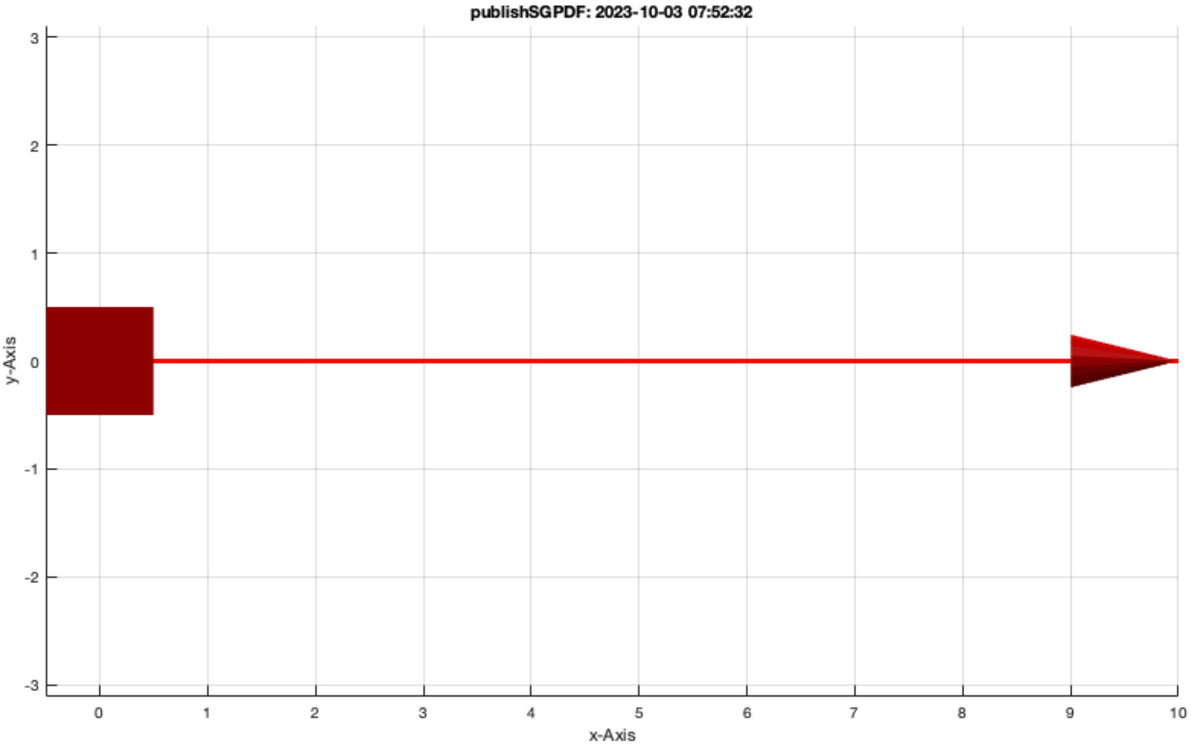
```
SGfigure; lplot([0 0],[10 0],'r-',3);
```



```
SGfigure; lplot([0 0],[10 0],'r-',3,1);
```

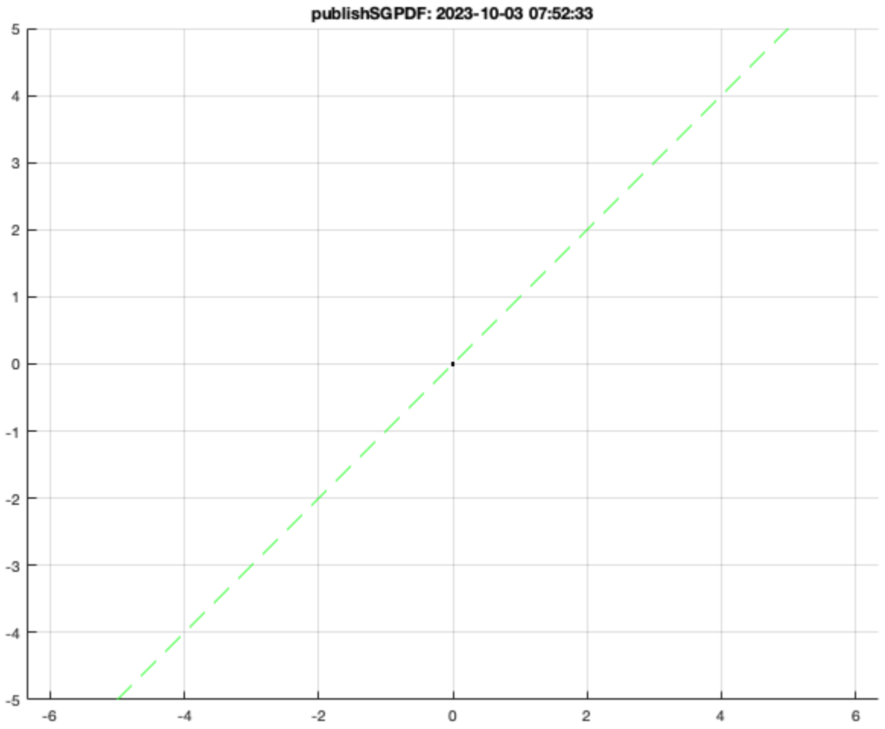


```
SGfigure; lplot([0 0],[10 0],'r-',3,1,1);
```



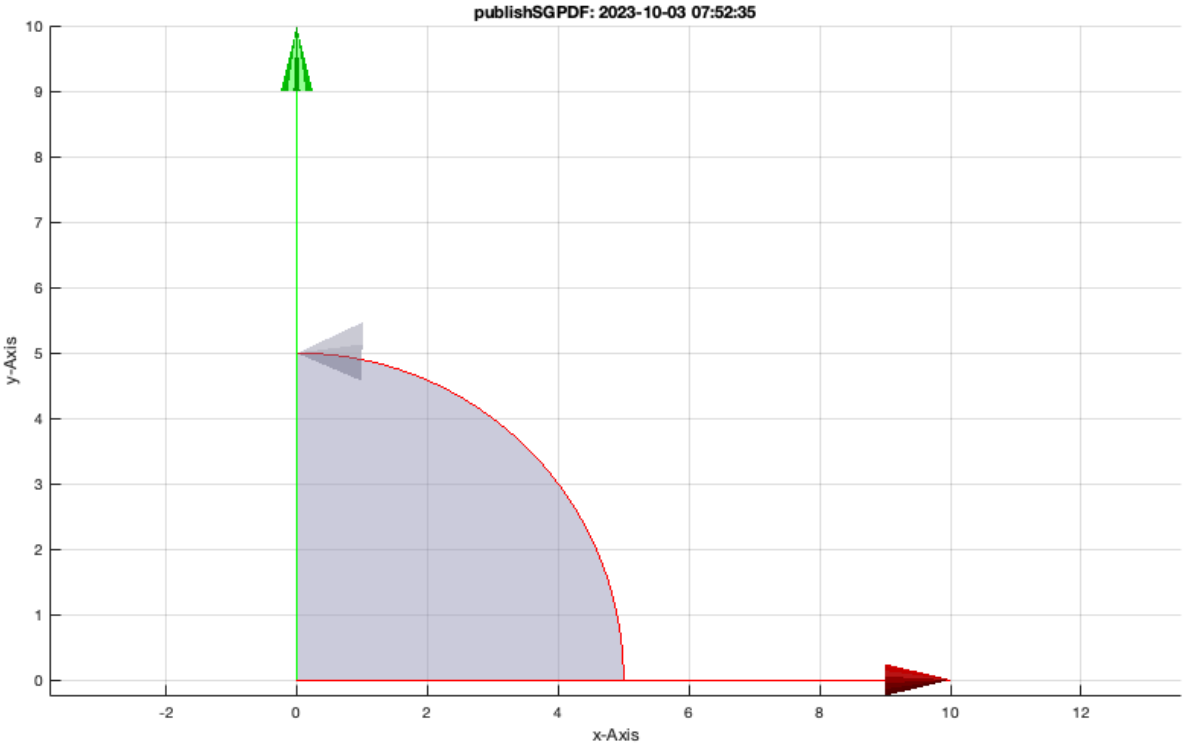
slplot([0 0],[10 0],'r-',3,1,1);

```
SGfigure; slplot([0 0 0],[1 1 1],'color','g--')
```



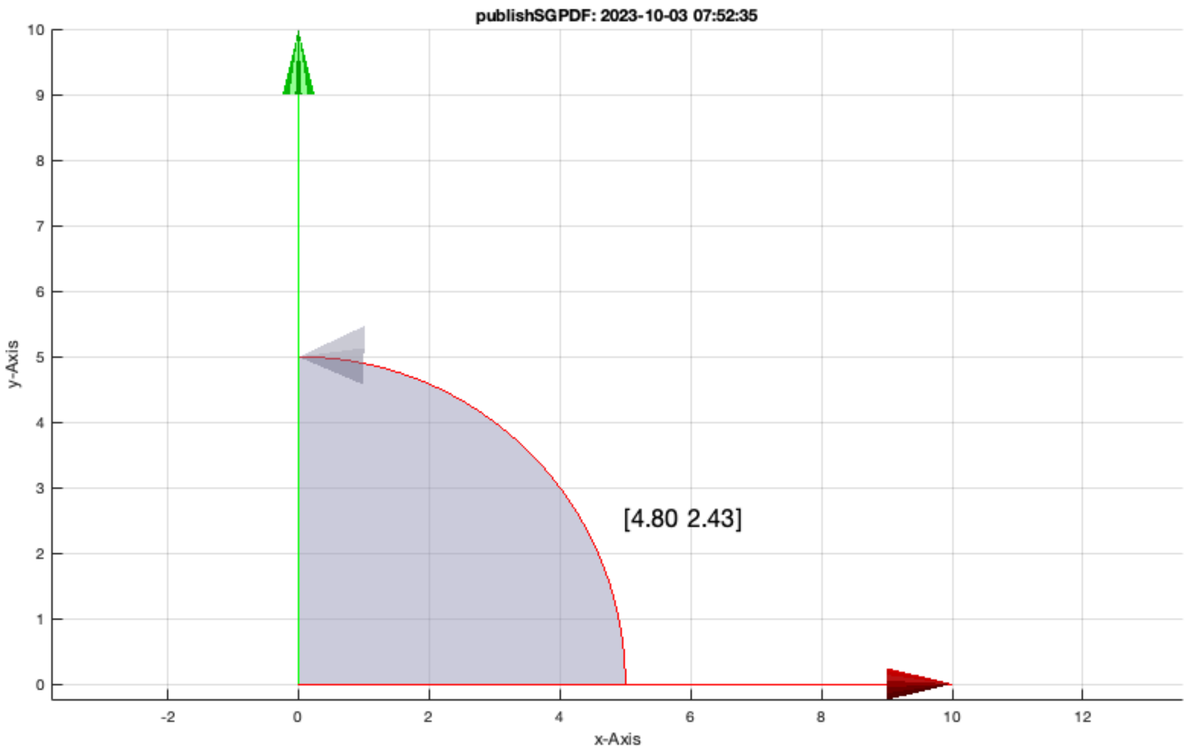
3. Plotting angles

```
SGfigure; aplot([0 0],[10 0],pi/2);
```



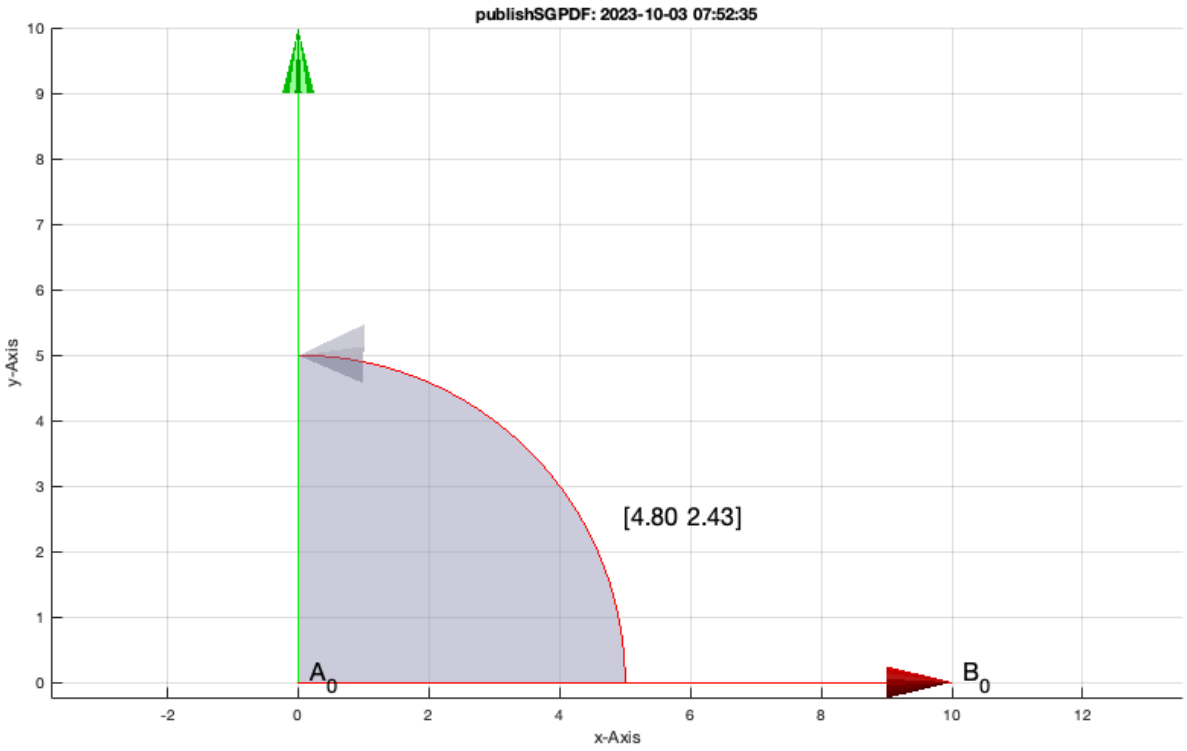
4. Plotting coordinate

```
p=ginput(1); textP (p,sprintf('[%.2f %.2f]',p));
```



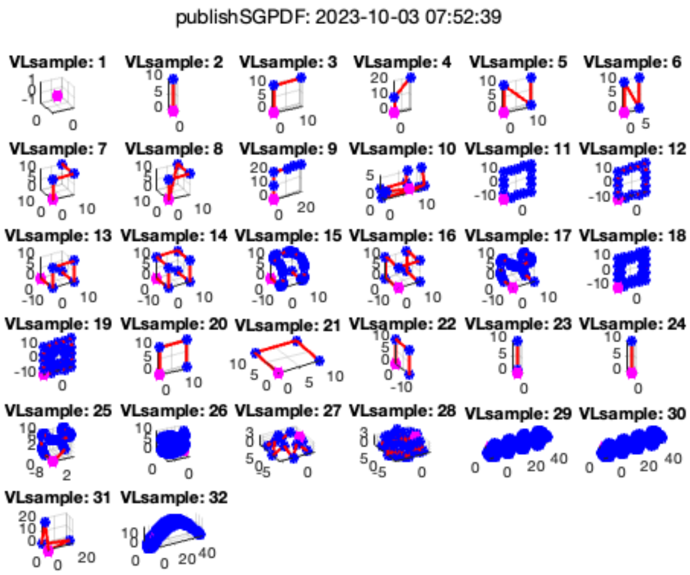
8. Adding text to the drawings

```
textP ([0 0],'A0'); textP ([10 0],'B0');
```

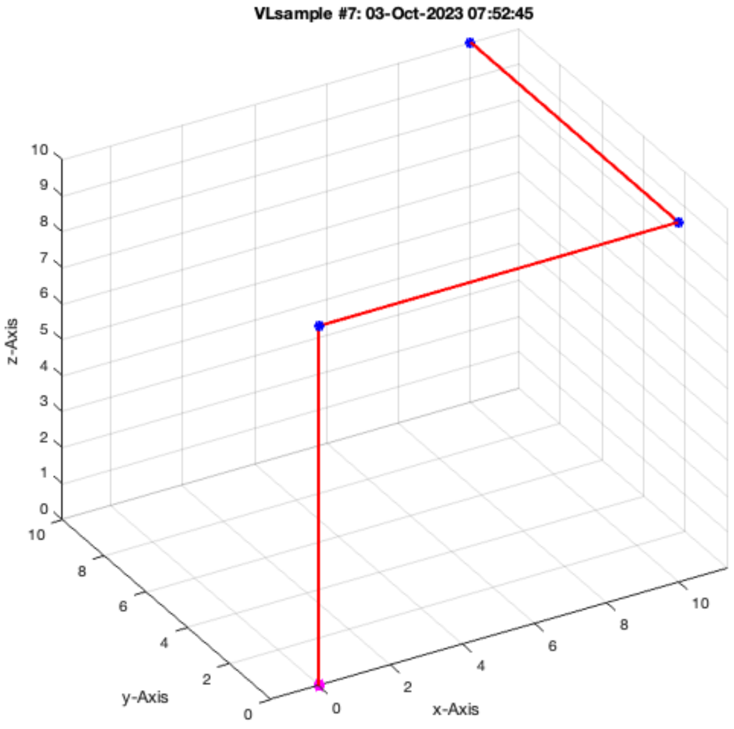


9. Helpful generic polygons for

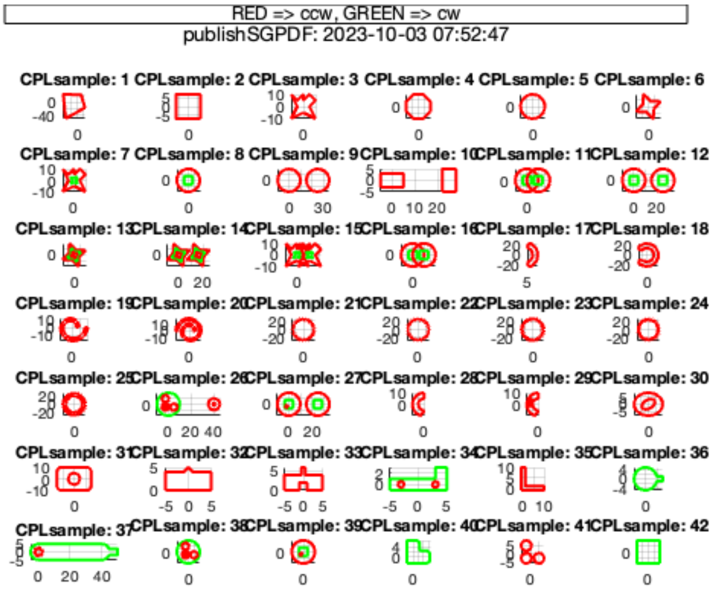
```
SGfigure; VLsample;
```



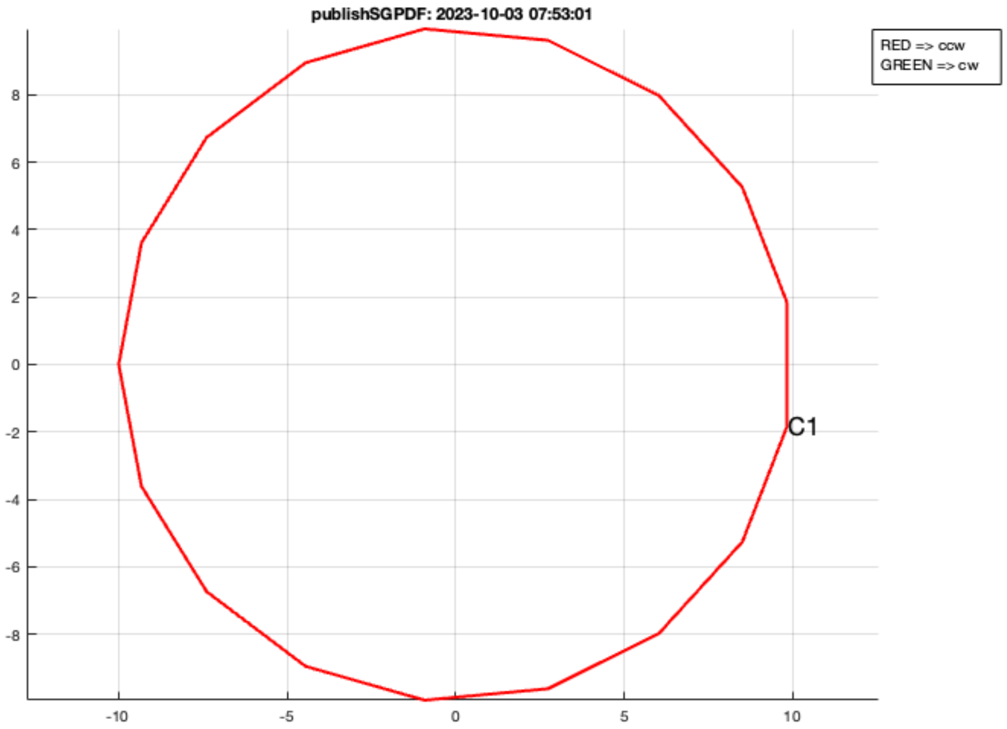
```
SGfigure; VLsample(7);
```



```
SGfigure; CPLsample;
```



```
SGfigure; CPLsample(5);
```



Final Remarks

```
close all
VLFLlicense
```

```
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Executed 03-Oct-2023 07:53:03 by 'timlueth' on a MACI64 using Mac OSX 13.6 | R2023a Update 5 | SG-Lib 5.4
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distrib_computing_toolbox
fixed_point_toolbox
map_toolbox
matlab
simmechanics
simscape
simulink
=====================================================================================================
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