Tutorial 64: Relative spatial arrangement of CPL contours

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Motivation for this tutorial: (Originally SolidGeometry 5.0 required)

In this tutorial the function CPLtransrelCPL is explained, which is behind the Boolean function of the CPL functions since SG-Lib 5.0 but can also be called separately

```
% function VLFL_EXP64   % must be commented for a publishable tutorial


help CPLtransrelCPL
```

```
  CPLtransrelCPL(CPLA,CPLB,rel,gap) - relative transformation of CPLs
        (by Tim Lueth, VLFL-Lib, 2021-JAN-05 as class: CLOSED POLYGON LISTS)

        Similar to SGtransrelSG, but based on CPLs!
        Supported operations are:
                bottom,under,down, ontop,up,top, left, right, trans,transP,
             transx, transy, mirrory, centerx, centery, incenter,center,
             alignright, alignleft, aligntop, alignbottom, alignunder,
             magnify, transT, alignrot, alignaxis, attached,touch,
             plus,add,+, intersect, subtract,-, sub, xor, cutleft,
             remainleft, cutright, isecbb,intersectbb, cutbb,subbb,
             grow, break,breakedge, rad,radial,radialedge, rotc,
             rot,rotz, debug, help,info,?' (Status of: 2021-02-05)

        Introduced first in SolidGeometry 5.0

        See also: SGtransrelSG, PLtrans

        CPL=CPLtransrelCPL(CPLA,CPLB,[rel,gap])
        === INPUT PARAMETERS ===
        CPLA:   Original contour to manipulate
        CPLB:   Contour that is considered as relation
        rel:    relation term such as 'ontop' or 'alignleft'
        gap:    optional numerical parameter
        === OUTPUT RESULTS ======
        CPL:    Resulting CPL

        EXAMPLE:
        CPLA=PLsquare(20,30); CPLB=PLcircle(8)+[pi pi];
        CPLtransrelCPL(CPLA,CPLB,'center','ontop','rot',pi/10,'rad',20);

        See also: SGtransrelSG, PLtrans


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```
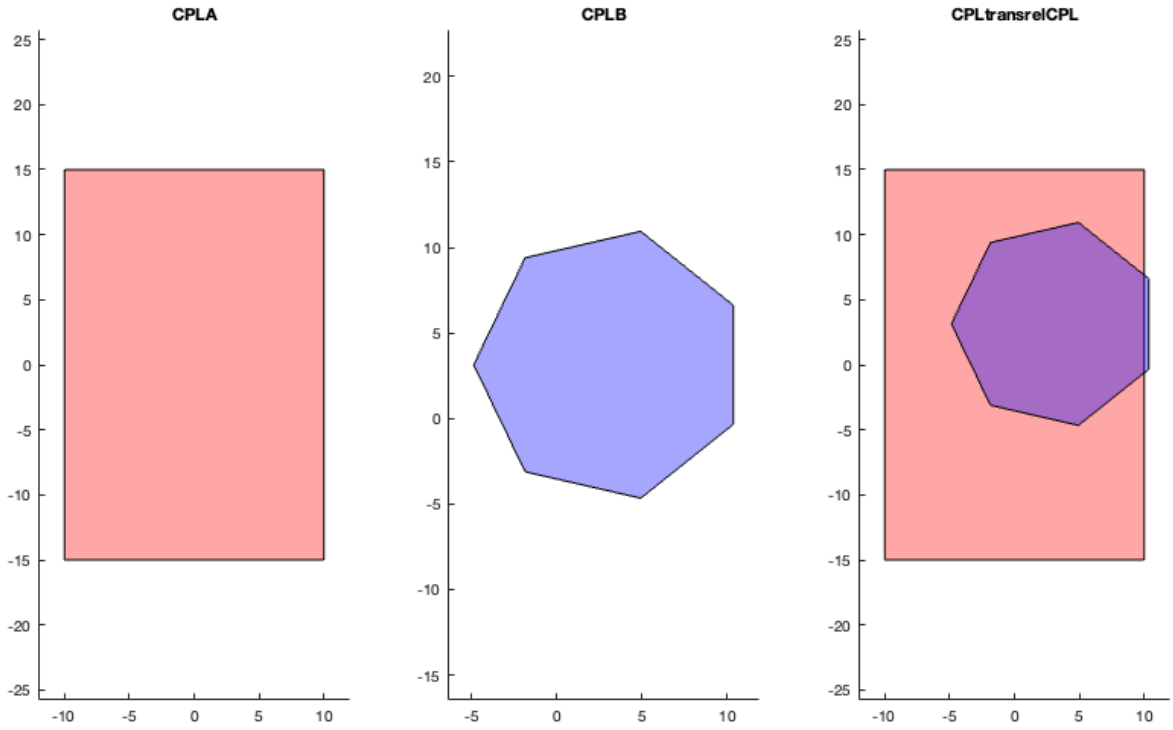
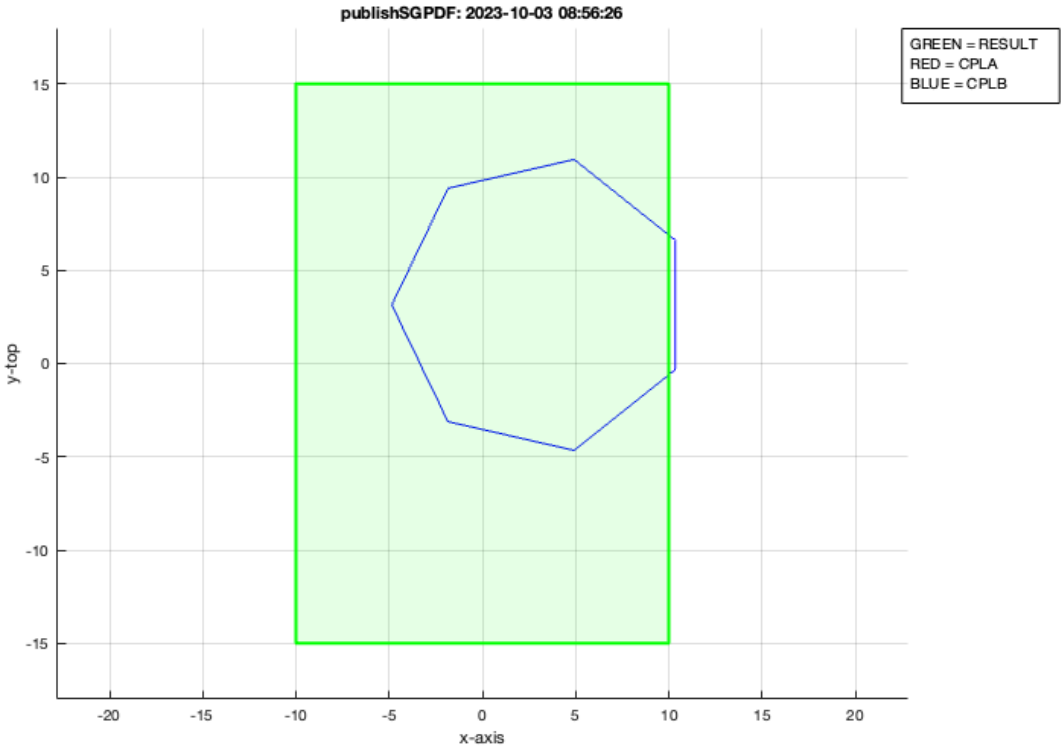

```
CPLA=PLsquare(20,30); CPLB=PLcircle(8,7)+[pi pi];
SGfigure;
```

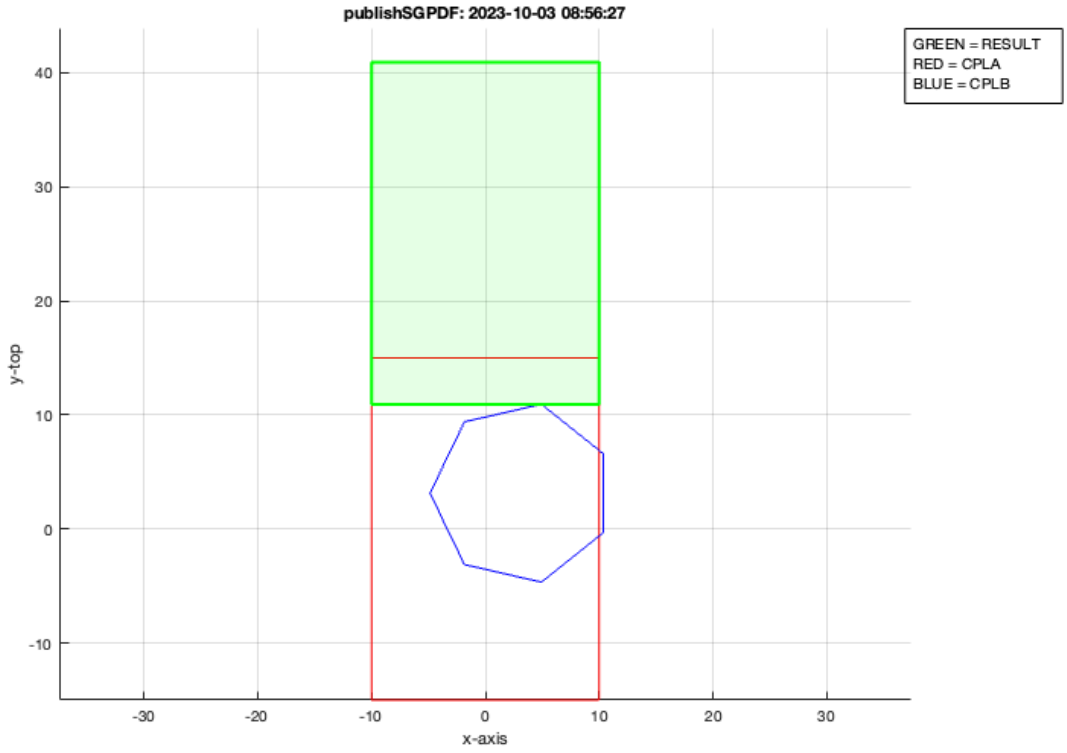
```
subplot(1,3,1); CPSplot(CPLA,'r');  title('CPLA'); axis equal;
subplot(1,3,2); CPSplot(CPLB,'b');  title ('CPLB'); axis equal;
subplot(1,3,3); CPSplot(CPLA,'r');  CPSplot(CPLB,'b');  title ('CPLtransrelCPL'); axis equal;
```



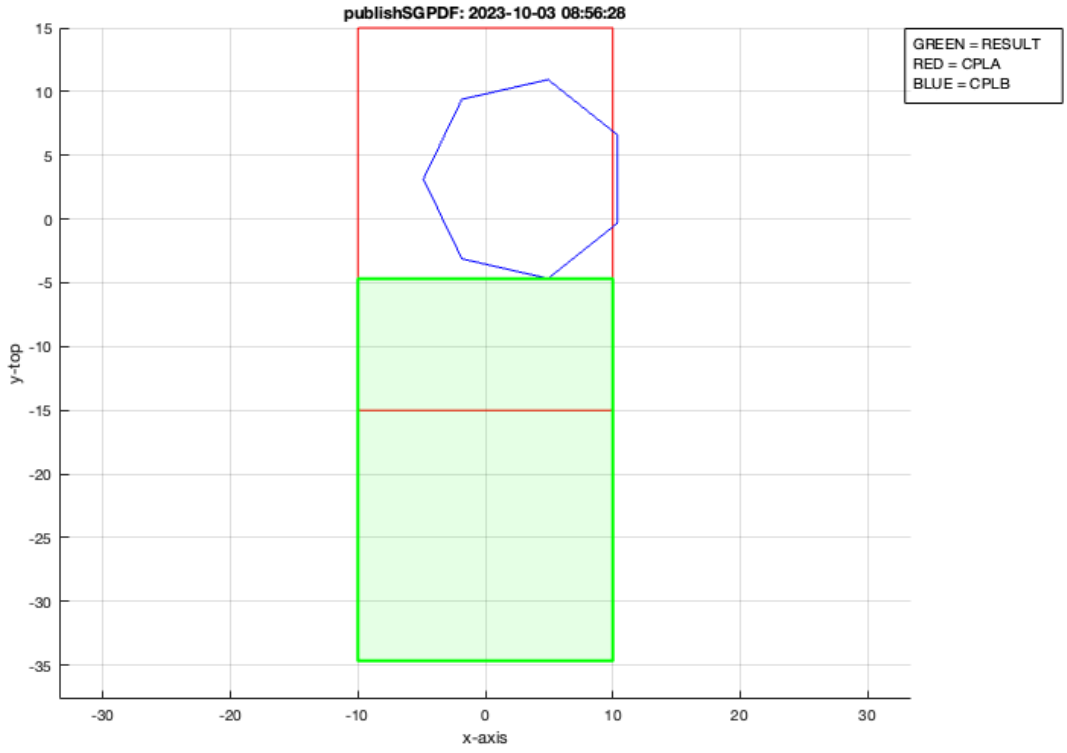

```
CPLtransrelCPL(CPLA,CPLB);
```



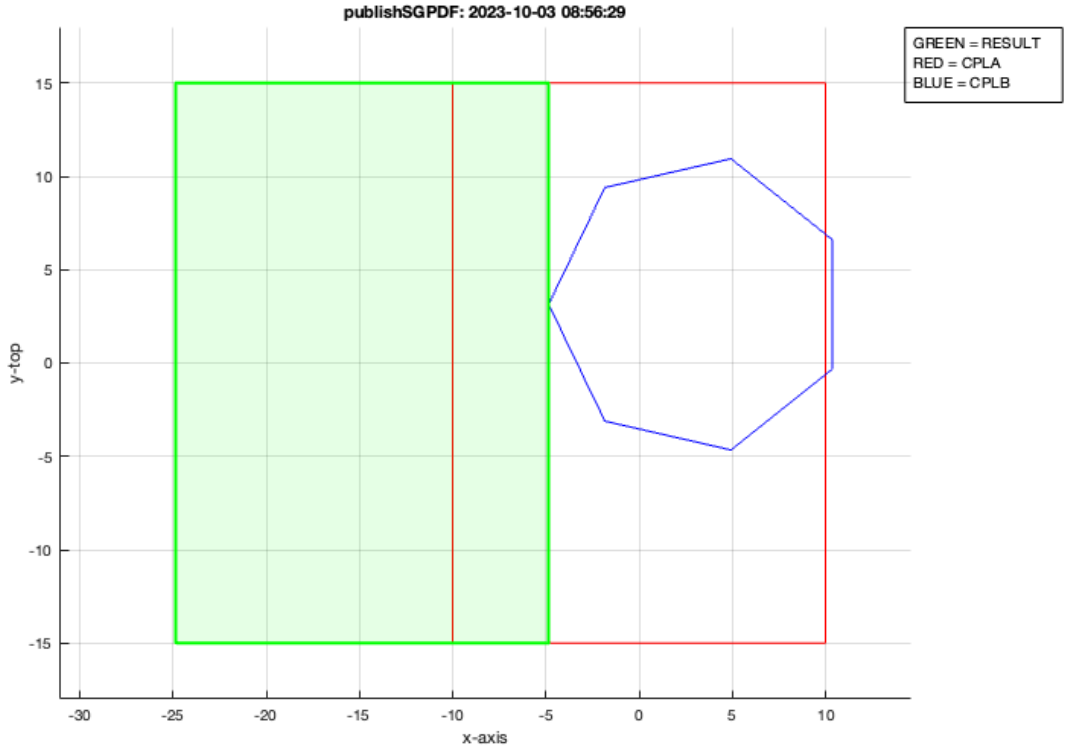

```
CPLtransrelCPL(CPLA,CPLB,'ontop');
```



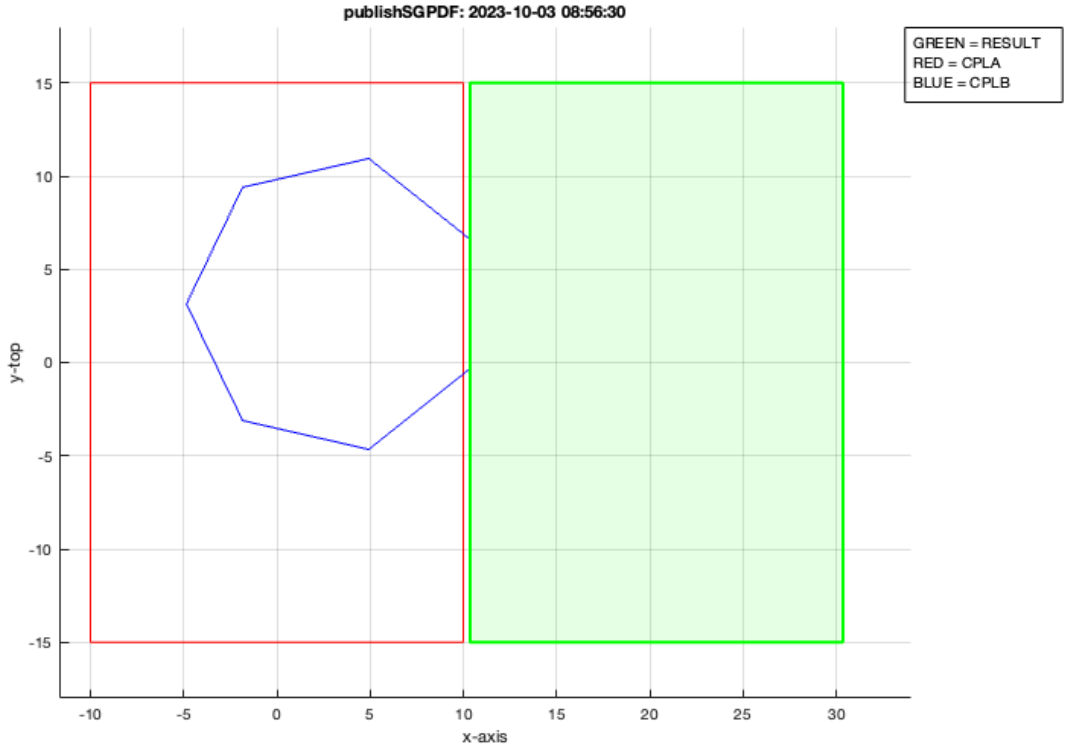

```
CPLtransrelCPL(CPLA,CPLB,'under');
```



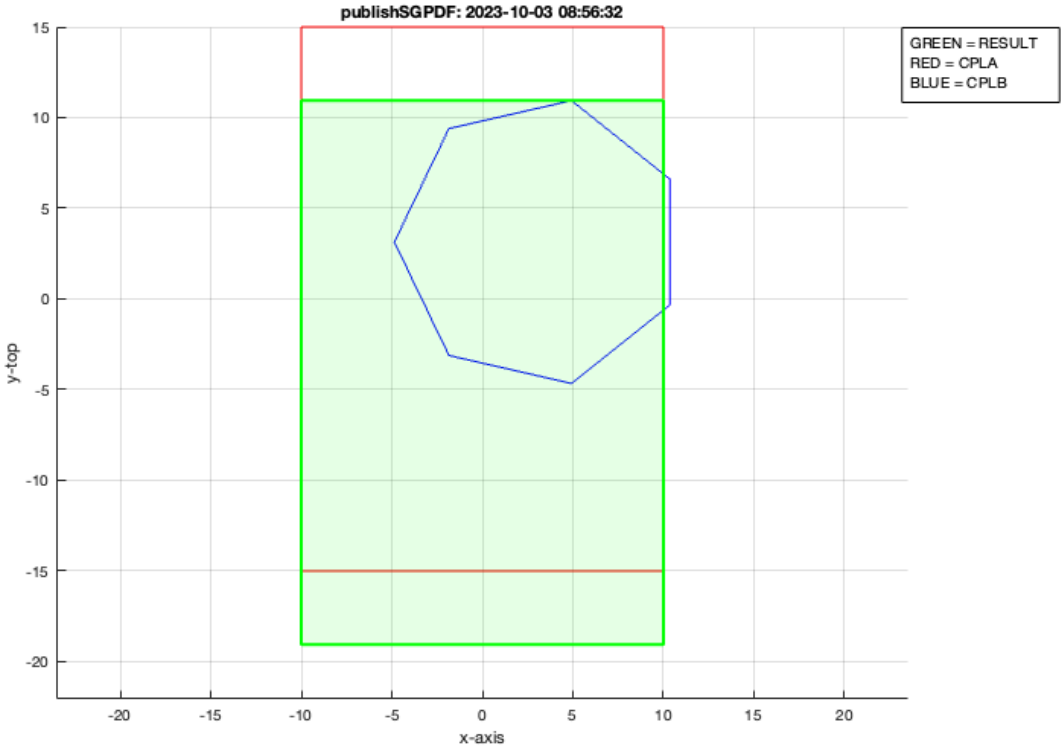

```
CPLtransrelCPL(CPLA,CPLB,'left');
```



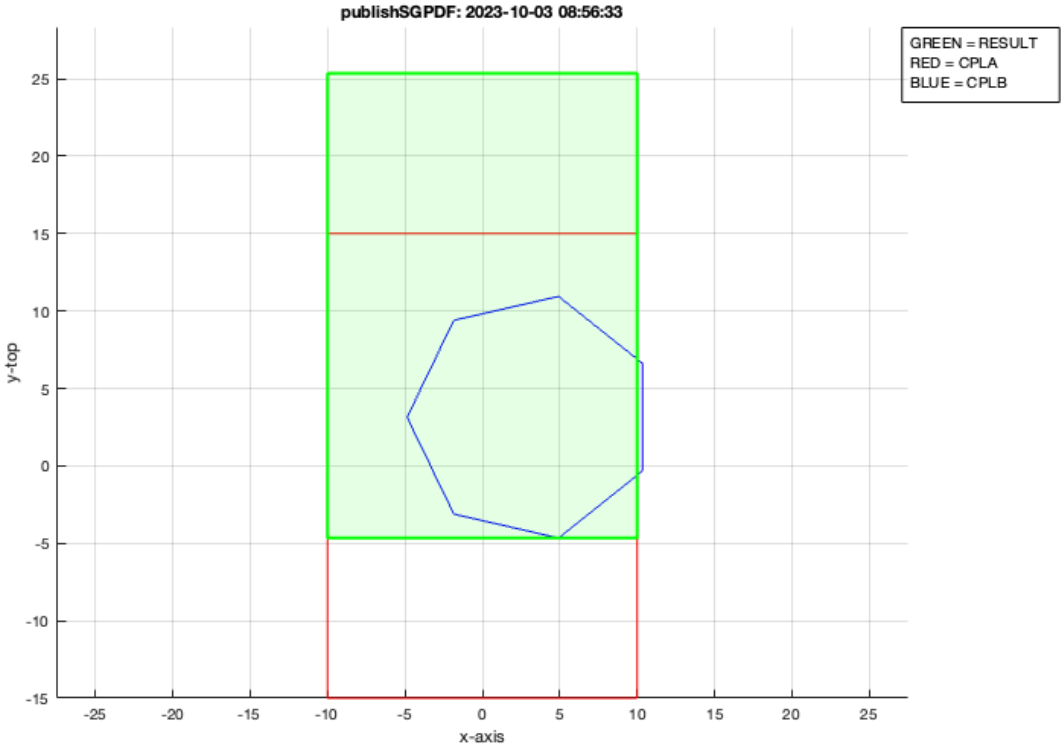

```
CPLtransrelCPL(CPLA,CPLB,'right');
```



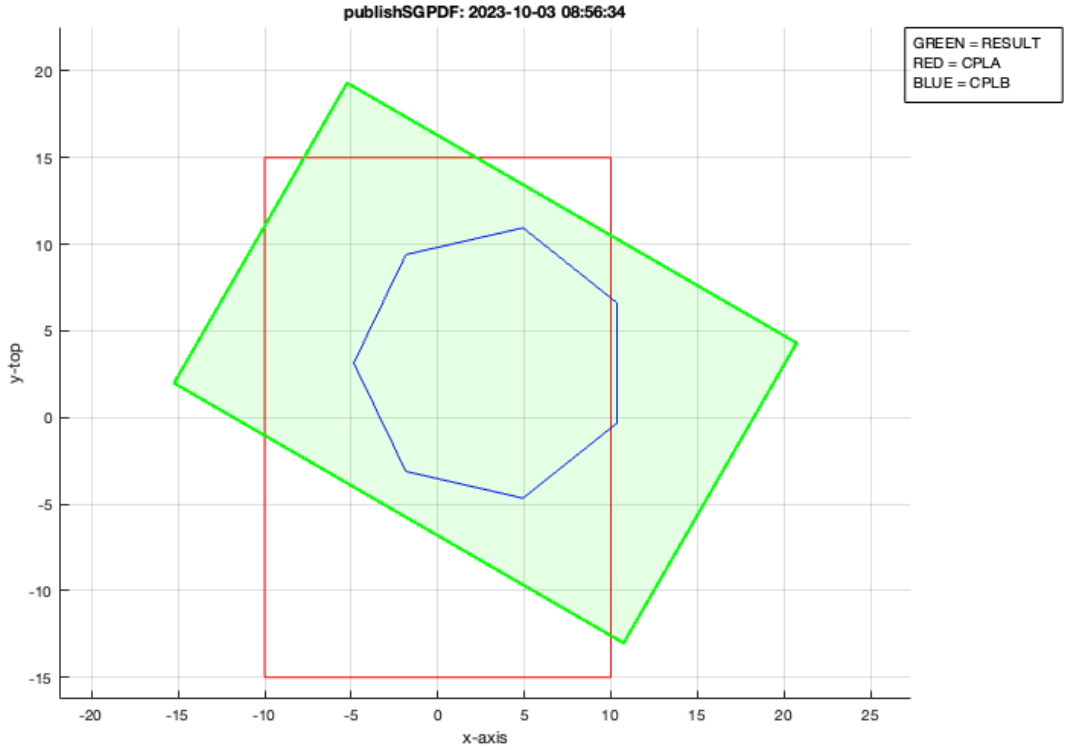

```
CPLtransrelCPL(CPLA,CPLB,'aligntop');
```



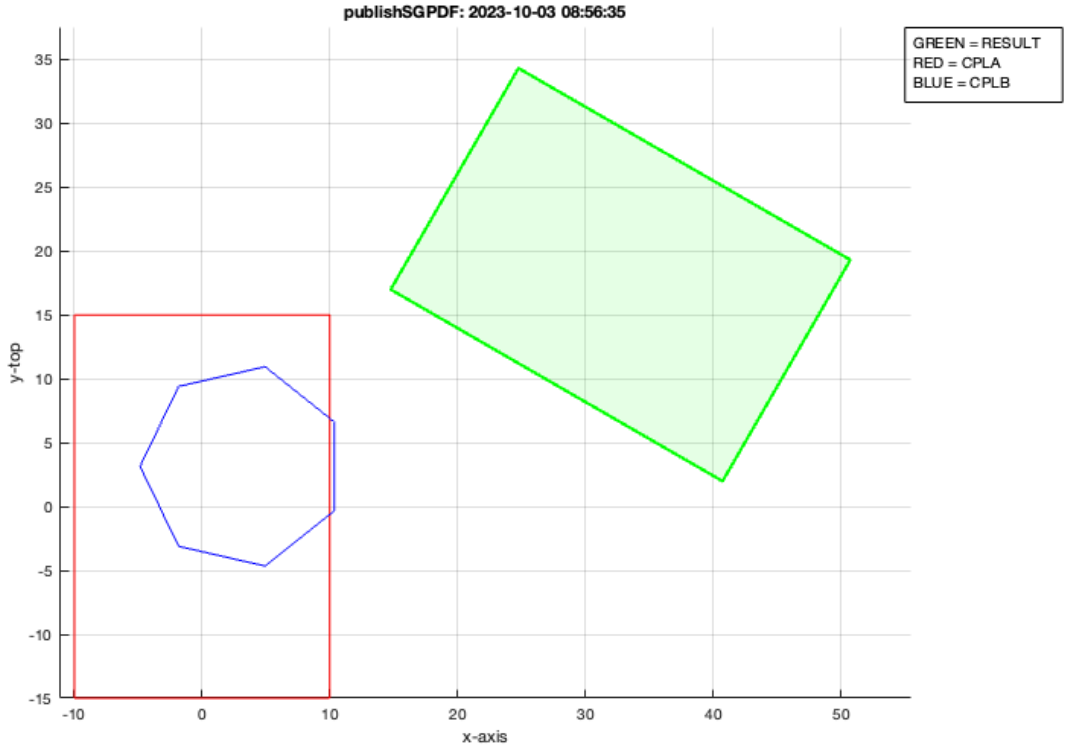

```
CPLtransrelCPL(CPLA,CPLB,'alignbottom');
```



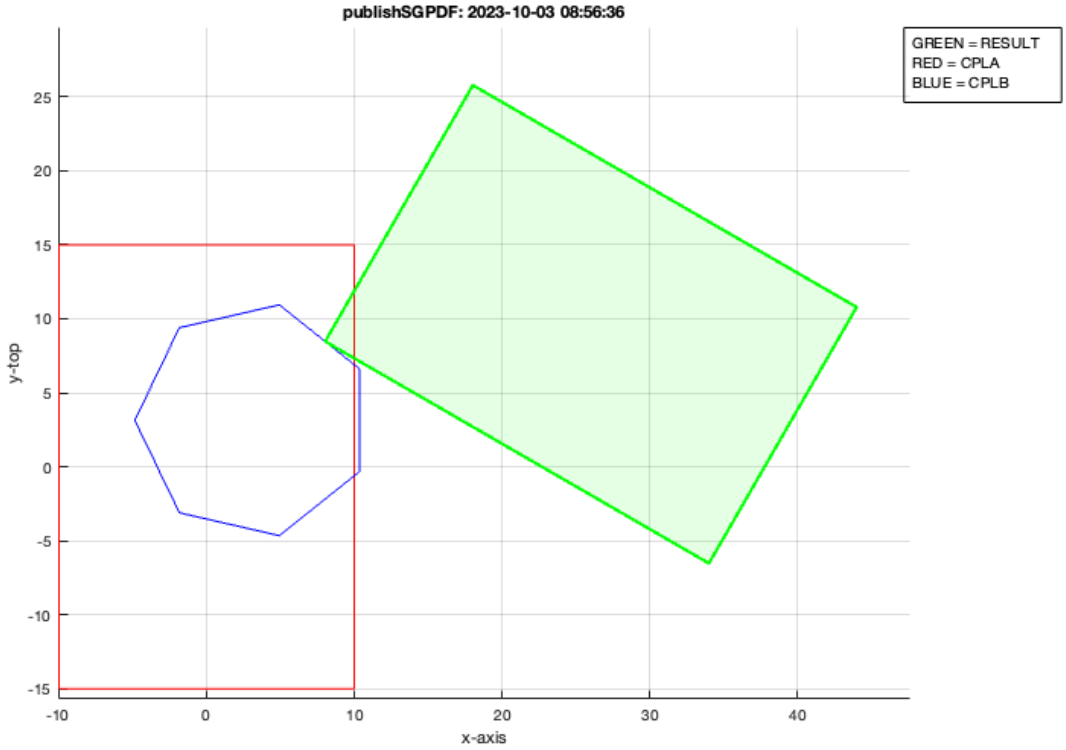

```
CPLtransrelCPL(CPLA,CPLB,'rotz',pi/3,'center');
```



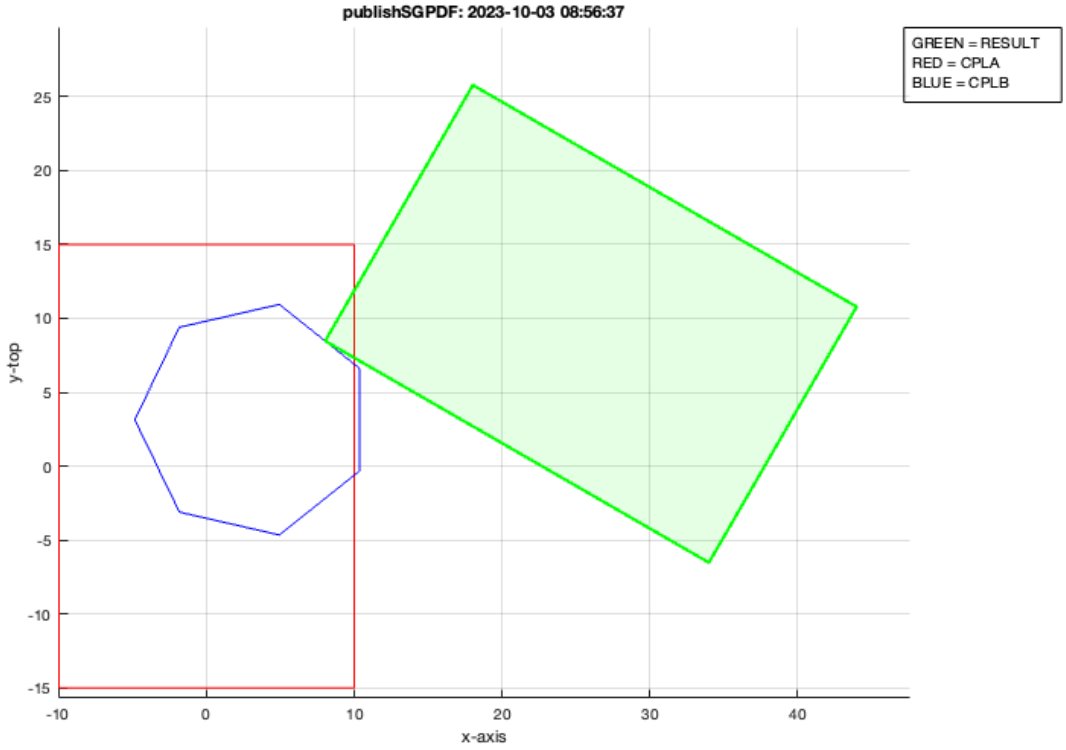

```
CPLtransrelCPL(CPLA,CPLB,'rotz',pi/3,'center','transx',30,'transy',15);
```



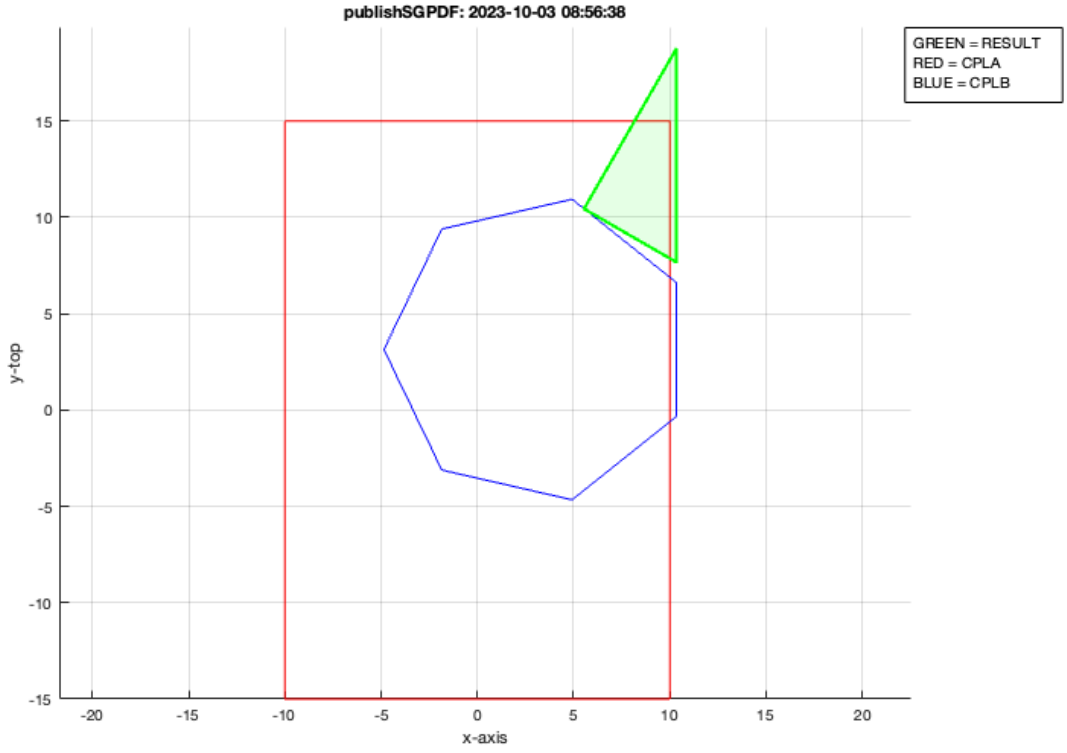

```
CPLtransrelCPL(CPLA,CPLB,'rotz',pi/3,'center','transx',30,'transy',15,'touch');
```



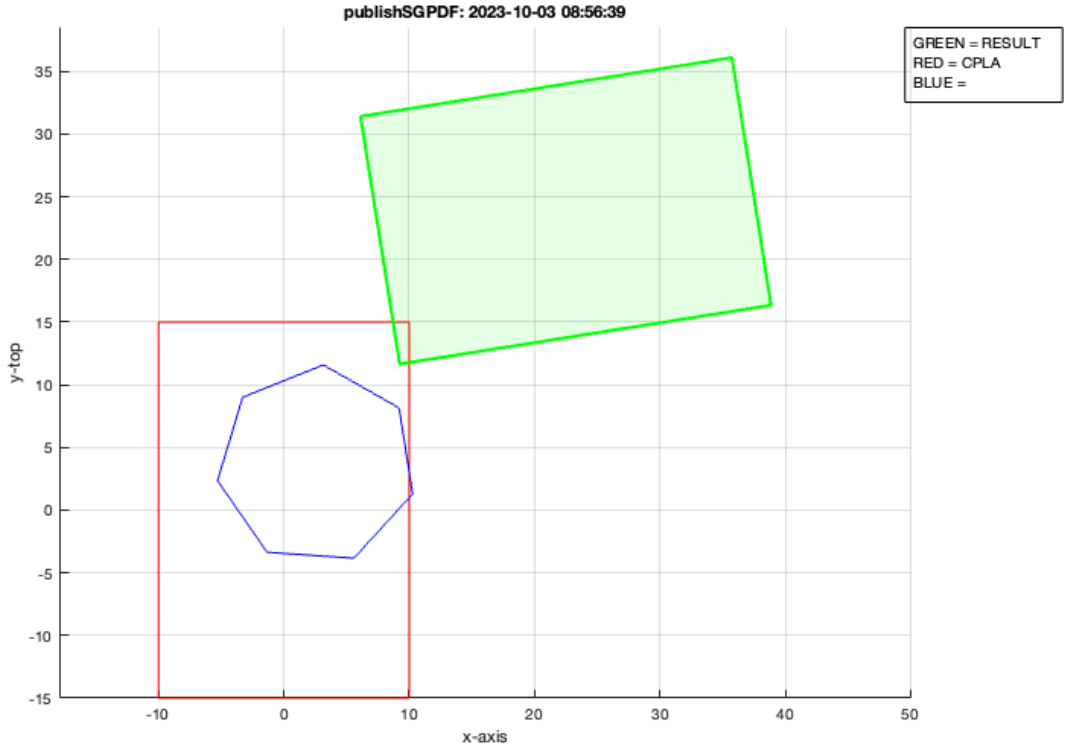

```
CPLtransrelCPL(CPLA,CPLB,'rotz',pi/3,'center','transx',30,'transy',15,'touch','cutleft');
```



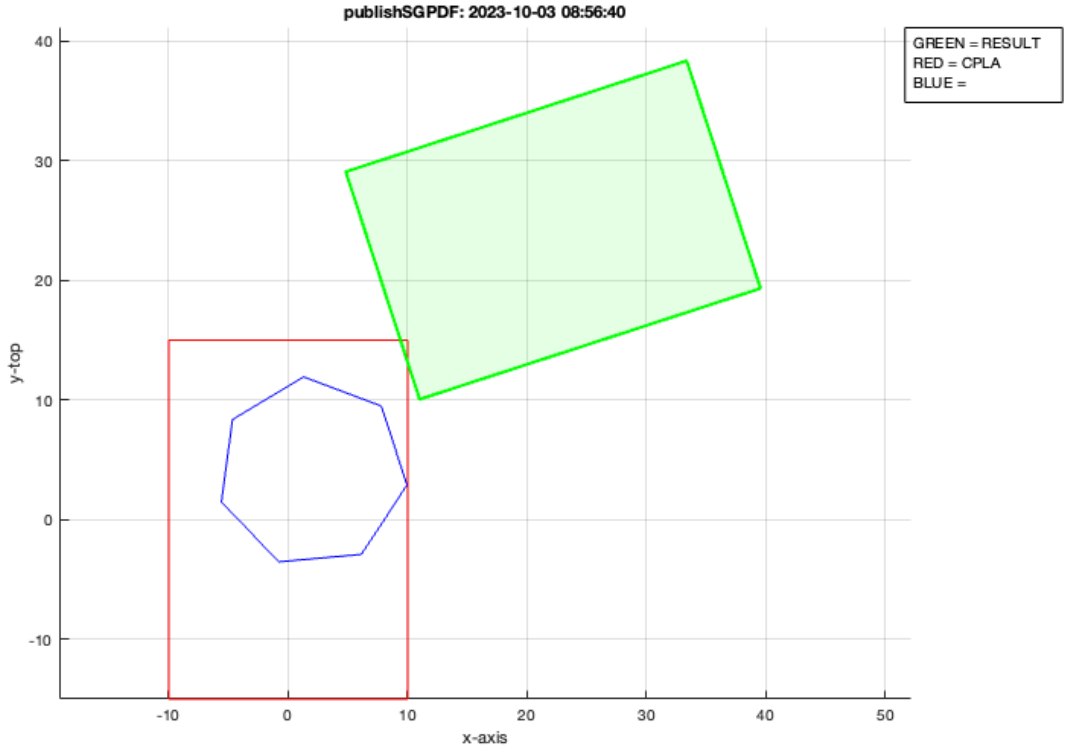

```
CPLtransrelCPL(CPLA,CPLB,'rotz',pi/3,'center','transx',30,'transy',20,'touch','cutright');
```




```
CPLtransrelCPL(CPLA,PLtransR(CPLB,pi/20),'rotz',pi/3,'center','transx',20,'transy',20,'alignrot');
```




```
CPLtransrelCPL(CPLA,PLtransR(CPLB,pi/10),'rotz',pi/3,'center','transx',20,'transy',20,'alignrot');
```



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