Assignment 6
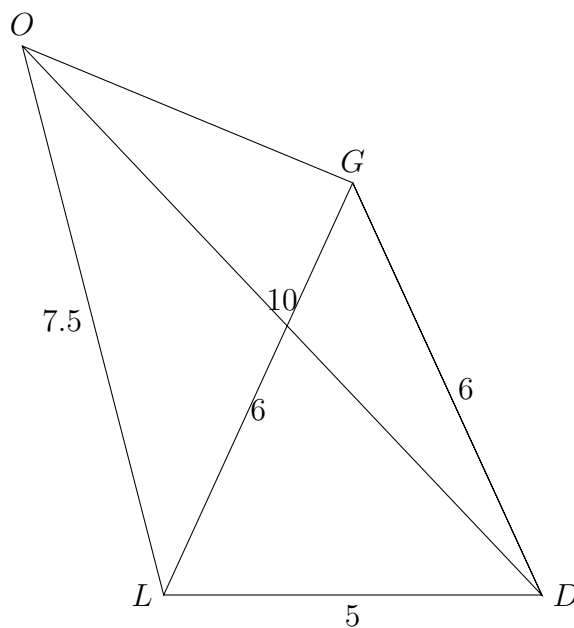
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Question

Draw GOLD such that OL = 7.5,GL =6,GD = 6, LD = 5, OD = 10.

Solution

Rough Sketch

TO draw the figure we need to find coordinates of all vertices

Assuming L as origin i,e L(0,0)

Therefore coordinates of D are (5,0)   (as LD = 5)

Now,let's find coordinates of vertices G and O.

Coordinates of G

G is the intersection point of line LG and DG.

Line LG:y = mx + c

   y=tan(∠GLD)x+c   (1)

∠GLD = $\cos^{-1}((6^2+5^2\text{-}6^2)/(2*6*5))$ (cosine rule)

Therefore,∠GLD=65.37°   (2)

Putting eqn(2) in eqn(1),we get

y = 2.18x + c

Also c=0   (as it passes through (0,0))

Therefore LG:y=2.18x   (A)

Similarly

Line DG:y = mx + c

   y=tan((180°-∠GDL)x+c   (3)(angles measured anti-clockwise)

∠GLD = $\cos^{-1}((6^2+5^2\text{-}6^2)/(2*6*5))$ (cosine rule)

Therefore,∠GDL=65.37°   (4)

Putting eqn(4) in eqn(3),we get

y = -2.18x + c

Also c=10.9   (as it passes through (5,0))

Line DG:y = -2.18x + 10.9   (B)

solving eqn(A) and eqn(B),we get

    x = 2.5; y = 5.45

Therefore coordinates of G are (2.5,5.45)

Coordinates of O

G is the intersection point of line LO and DO.

Line LO:y = mx + c

    $y=\tan(\angle OLD)x+c$ (5)

$\angle OLD = \cos^{-1}((7.5^2+5^2\text{-}10^2)/(2*7.5*5))$ (cosine rule)

Therefore,$\angle OLD=104.47°$ (6)

Putting eqn(6) in eqn(5),we get

y = -3.87x + c

Also c=0   (as it passes through (0,0))

Therefore LO:y= -3.87x   (C)

Similarly

Line DO:y = mx + c

    $y=\tan((180°\text{-}\angle ODL)x+c$ (7)(angles measured anti-clockwise)

$\angle OLD = \cos^{-1}((10^2+5^2\text{-}7.5^2)/(2*10*5))$ (cosine rule)

Therefore,$\angle ODL=46.56°$ (8)

Putting eqn(8) in eqn(7),we get

y = -1.056x + c

Also c=5.28   (as it passes through (5,0))

Line DO:y = -2.18x + 5.28   (D)

solving eqn(C) and eqn(D),we get

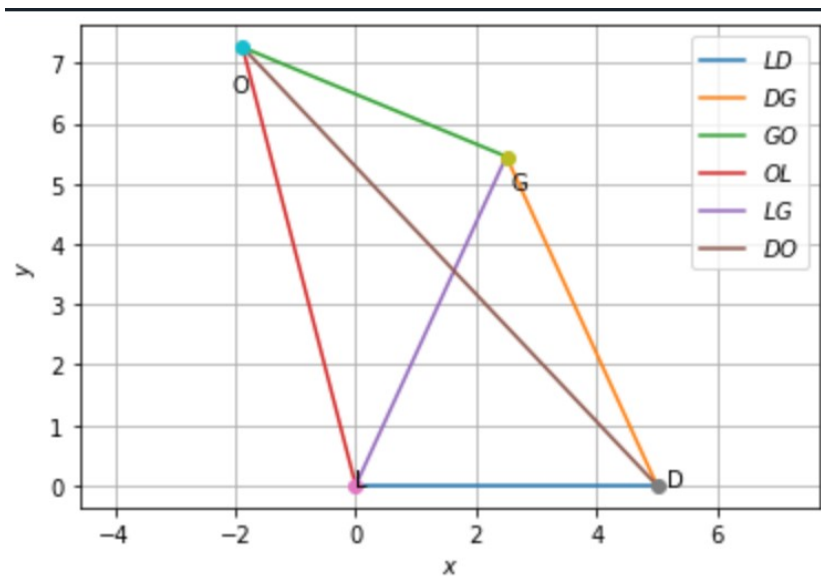   x = -1.87; y = 7.26

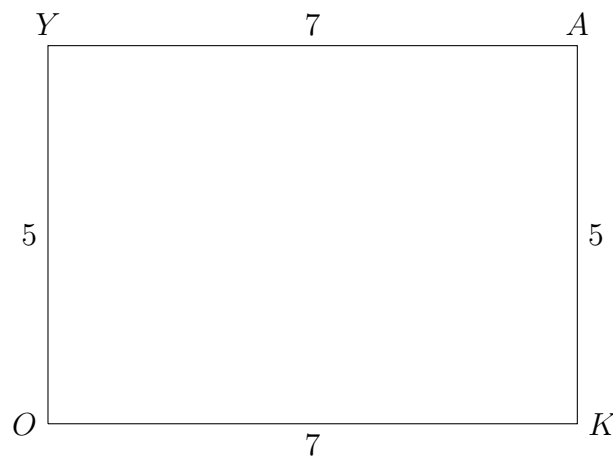Therefore coordinates of O are (-1.87,7.26)

Figure 1: Figure using python

Question

Draw rectangle OKAY with OK = 7 and KA =5.

Solution

As given figure is rectangle,therefore

 YO=5 ; AY=7 (opposite sides are equal)

Rough Sketch

To draw triangle, we need coordinates of all vertices
Assuming O as origin i,e O(0,0)

Therefore K has coordinates as (7,0)   (as OK=7)

Also it is clear;y mentioned that given figure rectangle

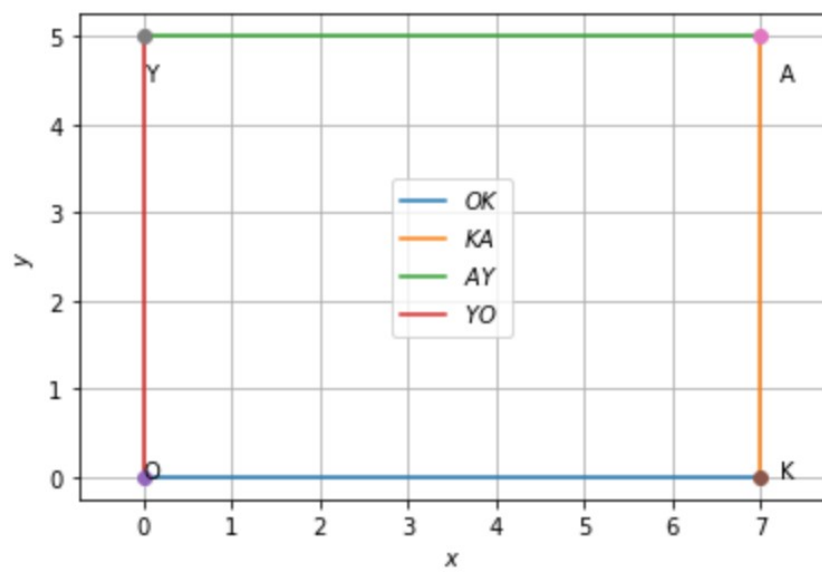Therefore A has coordinates as (7,5)   (as KA=5)

also Y has coordinates as (0,5)   (Figure is rectangle)

Figure 2: Figure using python