

كلية
المأمون
الجامعة

قسم

هندسة تقنيات
الحاسوب

المرحلة الاولى - ٢٠٢٢/٢٠٢٣

الرسم الهندسي
بعض الأمثلة
المحلولة
على الاوتوكاد

ACAD

Examples

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من أهم الطرق لرسم للاشكال في برنامج الاوتوكاد ثلاثة طرق هي:



1 ***ABSOLUTE COORDINATES***

2 ***RELATIVE COORDINATES***

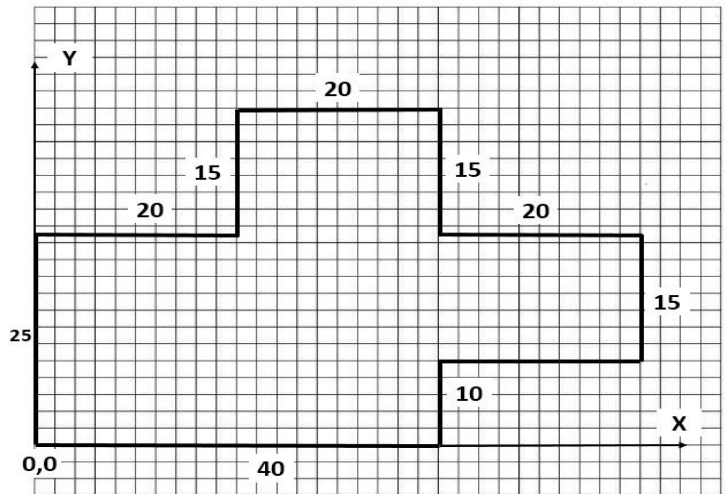
3 ***POLAR COORDINATES***

ACAD Examples

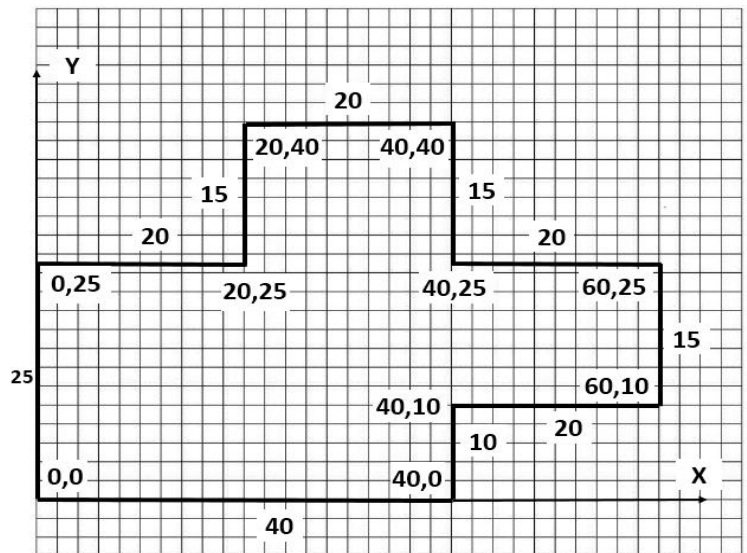
Example -1:

What are the orders needed for the computer to draw the following shape?

you can use any one of the following methods: Absolute Coordinates, Relative Coordinates or Polar Coordinates.



Solution:



Absolute Coordinates

Line	↖
0,0	↖
40,0	↖
40,10	↖
60,10	↖
60,25	↖
40,25	↖
40,40	↖
20,40	↖
20,25	↖
0,25	↖
0,0 (or c)	↖

Relative Coordinates

Line	↖
0,0	↖
@ 40,0	↖
@ 0,10	↖
@ 20,0	↖
@ 0,15	↖
@ -20,0	↖
@ 0,15	↖
@ -20,0	↖
@ 0,-15	↖
@ -20,0	↖
@ 0,-25	↖

Polar Coordinates

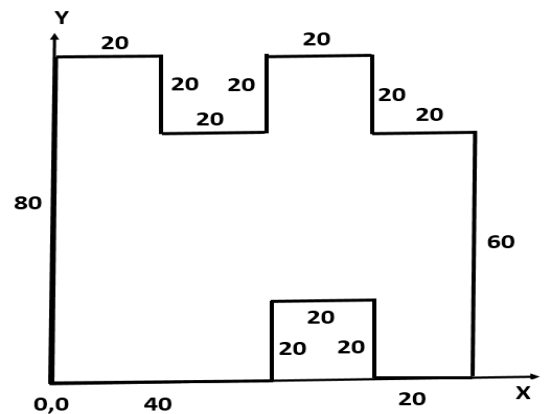
Line	↖
0,0	↖
@ 40 < 0	↖
@ 10 < 90	↖
@ 20 < 0	↖
@ 15 < 90	↖
@ 20 < 180	↖
@ 15 < 90	↖
@ 20 < 180	↖
@ 15 < 270	↖
@ 20 < 180	↖
@ 25 < 270	↖

Example -2:

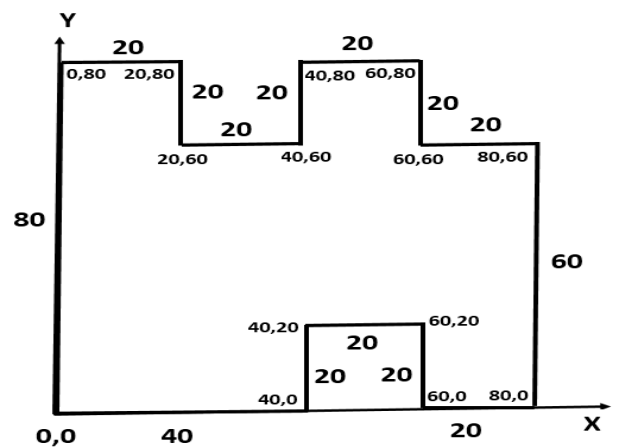
What are the orders needed for the computer to draw the following shape?

you can use any one of the following methods:

Absolute Coordinates,
Relative Coordinates or
Polar Coordinates.



Solution:



Absolute Coordinates

Line	↖
0,0	↖
40,0	↖
40,20,	↖
60,20	↖
60,0	↖
80,0	↖
80,60	↖
60,60	↖
60,80	↖
40,80	↖
40,60	↖
20,60	↖
20,80	↖
0,80	↖
0,0	↖

Relative Coordinates

Line	↖
0,0	↖
@ 40,0	↖
@ 0,20	↖
@ 20,0	↖
@ 0,-20	↖
@ 20,0	↖
@ 0,60	↖
@ -20,0	↖
@ 0,20	↖
@ -20,0	↖
@ 0,-20	↖
@ -20,0	↖
@ 0,20	↖
@ -20,0	↖
@ 0,-80	↖

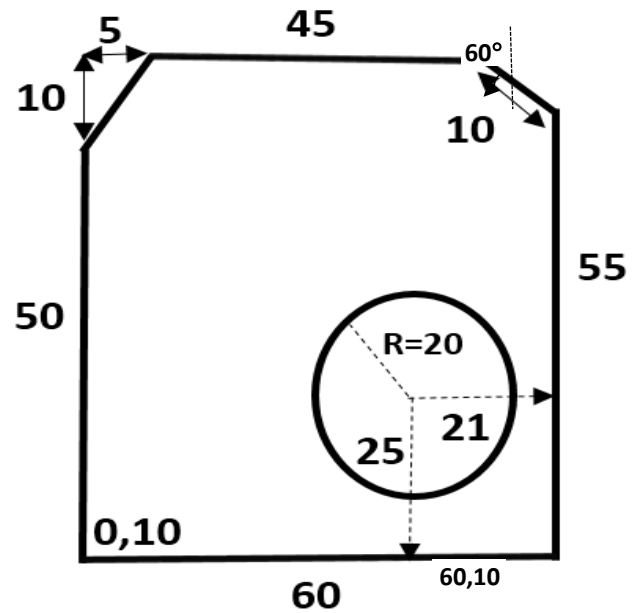
Polar Coordinates

Line	↖
0,0 <	↖
@ 40 < 0	↖
@ 20 < 90	↖
@ 20 < 0	↖
@ 20 < 270	↖
@ 20 < 0	↖
@ 60 < 90	↖
@ 20 < 180	↖
@ 20 < 90	↖
@ 20 < 180	↖
@ 20 < 270	↖
@ 20 < 180	↖
@ 20 < 90	↖
@ 20 < 180	↖
@ 80 < 270	↖

Example -3:

Draw the following shape using ACAD orders ?

you can choose one or more of the following methods: Absolute Coordinates, Relative Coordinates, Polar Coordinates.



Solution:

In this example we use the three methods to solve it.

		Line	↖
Absolute method	{	0,10	↖
		60,10	↖
polar method	{	@ 55 < 90	↖
		@ 10 < 150	↖
		@ 45 < 180	↖
relative method	{	@ -5 , -10	↖
polar method	{	@ 50 < 270	↖
		circle	↖
		Center (39,35)	↖
		R = 20	↖
			↖

Center is calculated as follows: $X = 60 - 21 = 39$

$$Y = 10 + 25 = 35$$

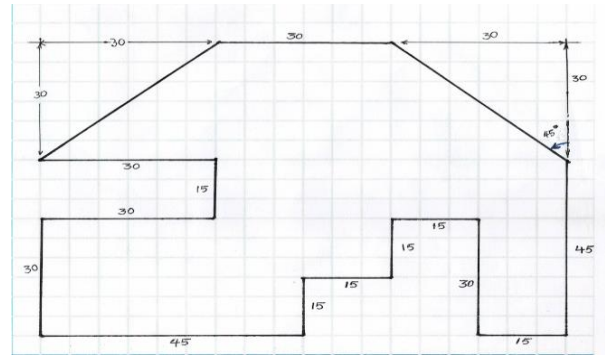
The angle 150° is calculated as follows: $90^\circ + 60^\circ = 150^\circ$

Example -4:

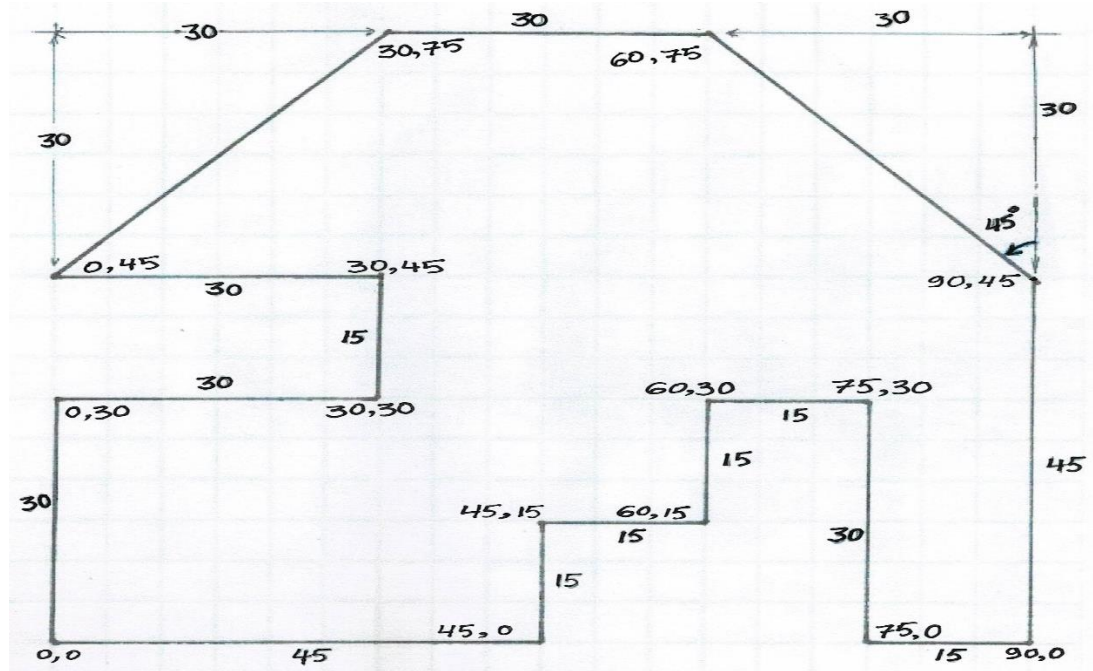
What are the orders needed for the computer to draw the following shape?

you can use any one of the following methods:

Absolute Coordinates,
Relative Coordinates or
Polar Coordinates.



Solution:



Absolute Coordinates

Line	↙
0,0	↙
45,0	↙
45,15	↙
60,15	↙
60,30	↙
75,30	↙
75,0	↙
90,0	↙
90,45	↙
60,75	↙
30,75	↙
0,45	↙
30,45	↙
30,30	↙
0,30	↙
0,0	↙

Relative Coordinates

Line	↙
0,0	↙
@ 45,0	↙
@ 0,15	↙
@ 15,0	↙
@ 0,15	↙
@ 15,0	↙
@ 0,-30	↙
@ 15,0	↙
@ 0,45	↙
@ -30,30	↙
@ -30,0	↙
@ -30,-30	↙
@ 30,0	↙
@ 0,-15	↙
@ -30,0	↙
@ 0,-30	↙

Polar Coordinates

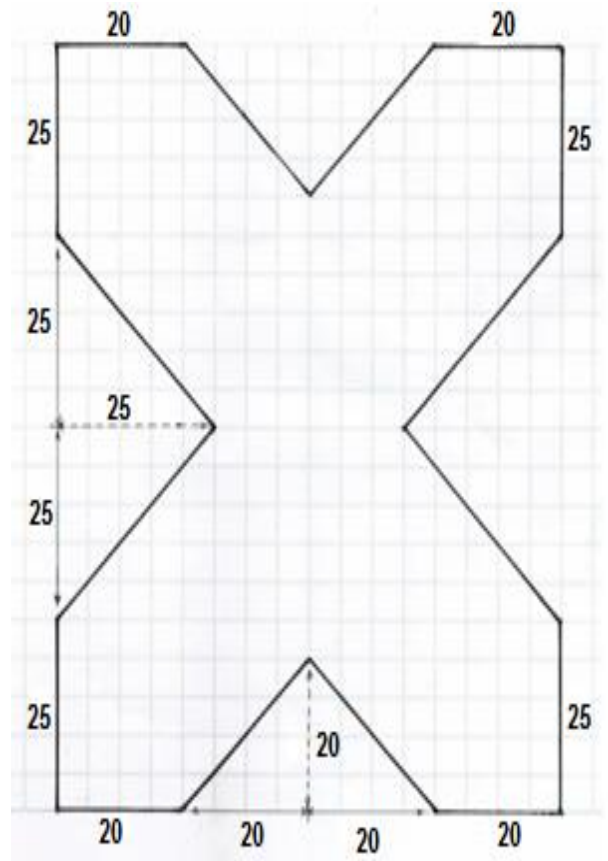
Line	↙
0,0	↙
@ 45 < 0	↙
@ 15 < 90	↙
@ 15 < 0	↙
@ 15 < 90	↙
@ 15 < 0	↙
@ 30 < -90	↙
@ 15 < 0	↙
@ 45 < 90	↙
@ 42.5 < 135	↙
@ 30 < 180	↙
@ 42.5 < 225	↙
@ 30 < 0	↙
@ 15 < -90	↙
@ 30 < 180	↙
@ 30 < -90	↙

Example -5:

What are the orders needed for the computer to draw the following shape?

you can use any one of the following methods:

Absolute Coordinates,
Relative Coordinates or
Polar Coordinates.



Solution:

Absolute Coordinates

Line	↵
0,0	↵
20,0	↵
40,20	↵
60,0	↵
80,0	↵
80,25	↵
55,50	↵
80,75	↵
80,100	↵
60,100	↵
40,80	↵
20,100	↵
0 ,100	↵
0 ,75	↵
30,50	↵
0 ,25	↵
0,0	↵

Relative Coordinates

Line	↵
0,0	↵
@ 20,0	↵
@ 20,20	↵
@ 20,-20	↵
@ 20,0	↵
@ 0 ,25	↵
@ -25,25	↵
@ 25,25	↵
@ 0 ,25	↵
@ -20,0	↵
@ -20,-20	↵
@ -20,20	↵
@ -20,0	↵
@ 0 ,-25	↵
@ 25,-25	↵
@ -25,-25	↵
@ 0 ,-25	↵

Polar Coordinates

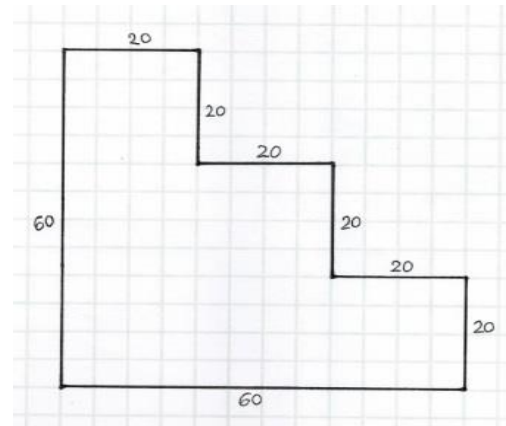
Line	↵
0,0	↵
@ 20 < 0	↵
@ 28.3 < 45	↵
@ 28.3 < -45	↵
@ 20 < 0	↵
@ 25 < 90	↵
@ 35.4 < 135	↵
@ 35.4 < 45	↵
@ 25 < 90	↵
@ 20 < 180	↵
@ 28.3 < 225	↵
@ 28.3 < 135	↵
@ 20 < 180	↵
@ 25 < 270	↵
@ 35.4 < -45	↵
@ 35.4 < 225	↵
@ 25 < 270	↵

Example -6:

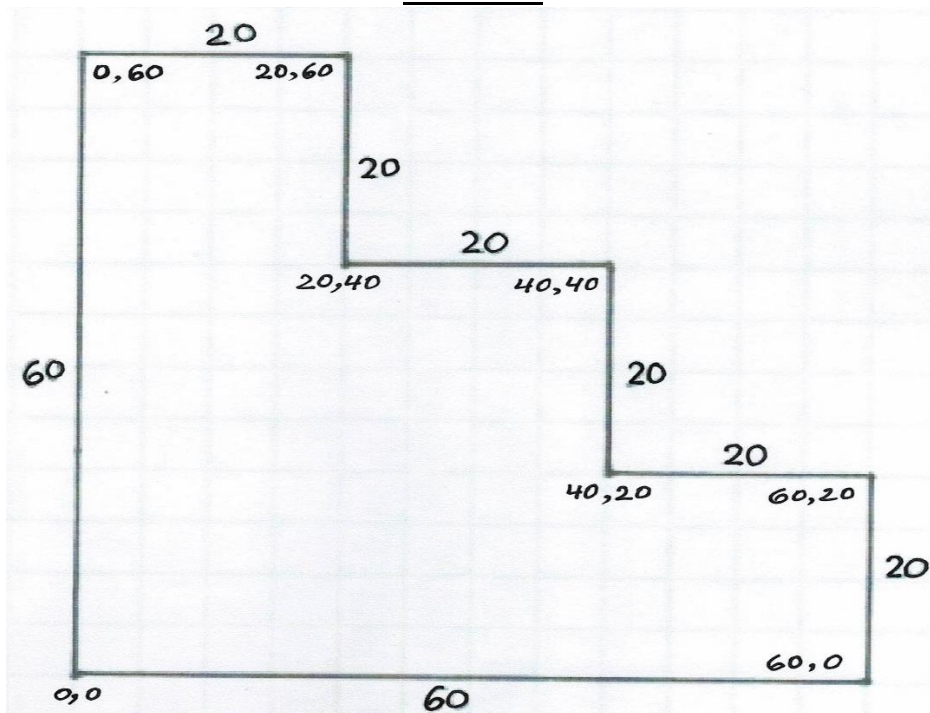
What are the orders needed for the computer to draw the following shape?

you can use any one of the following methods:

Absolute Coordinates, Relative Coordinates or Polar Coordinates.



Solution:



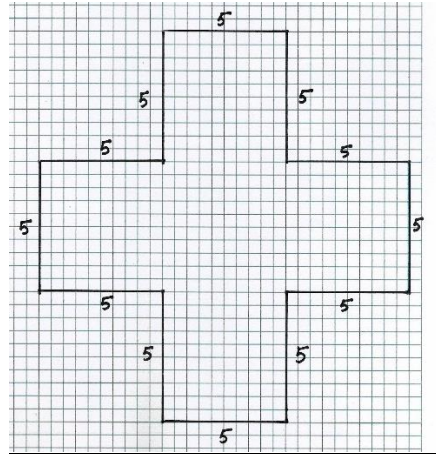
<u>Absolute Coordinates</u>		<u>Relative Coordinates</u>		<u>Polar Coordinates</u>	
Line	↖	Line	↖	Line	↖
0 , 0	↖	0,0	↖	0,0	↖
0 , 60	↖	@ 0 , 60	↖	@ 60 < 90	↖
20 , 60	↖	@ 20 , 0	↖	@ 20 < 0	↖
20 , 40	↖	@ 0 , -20	↖	@ 20 < 270	↖
40 , 40	↖	@ 20 , 0	↖	@ 20 < 0	↖
40 , 20	↖	@ 0 , -20	↖	@ 20 < 270	↖
60 , 20	↖	@ 20 , 0	↖	@ 20 < 0	↖
60 , 0	↖	@ 0 , -20	↖	@ 20 < 270	↖
0 , 0	↖	@ -60, 0	↖	@ 60 < 180	↖

Example -7:

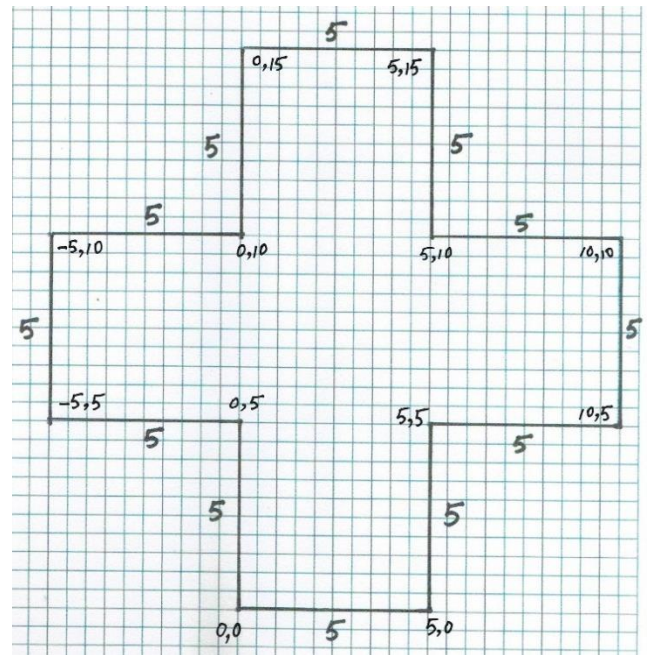
What are the orders needed for the computer to draw the following shape?

you can use any one of the following methods:

Absolute Coordinates,
Relative Coordinates or
Polar Coordinates.



Solution:



Absolute Coordinates

Line	↙
0,0	↖
5,0	↖
5,5	↖
10,5	↖
10,10	↖
5,10	↖
5,15	↖
0,15	↖
0,10	↖
-5,10	↖
-5,5	↖
0,5	↖
0,0	↖

Relative Coordinates

Line	↙
0,0	↖
@ 5,0	↖
@ 0,5	↖
@ 5,0	↖
@ 0,5	↖
@ -5,0	↖
@ 0,5	↖
@ -5,0	↖
@ 0,-5	↖
@ -5,0	↖
@ 0,-5	↖
@ 5,0	↖
@ 0,-5	↖

Polar Coordinates

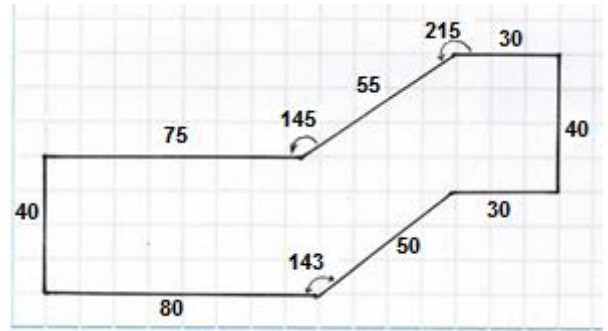
Line	↙
0,0	↖
@ 5 < 0	↖
@ 5 < 90	↖
@ 5 < 0	↖
@ 5 < 90	↖
@ 5 < 180	↖
@ 5 < 90	↖
@ 5 < 180	↖
@ 5 < -90	↖
@ 5 < 180	↖
@ 5 < 270	↖
@ 5 < 0	↖
@ 5 < 270	↖

Example -8:

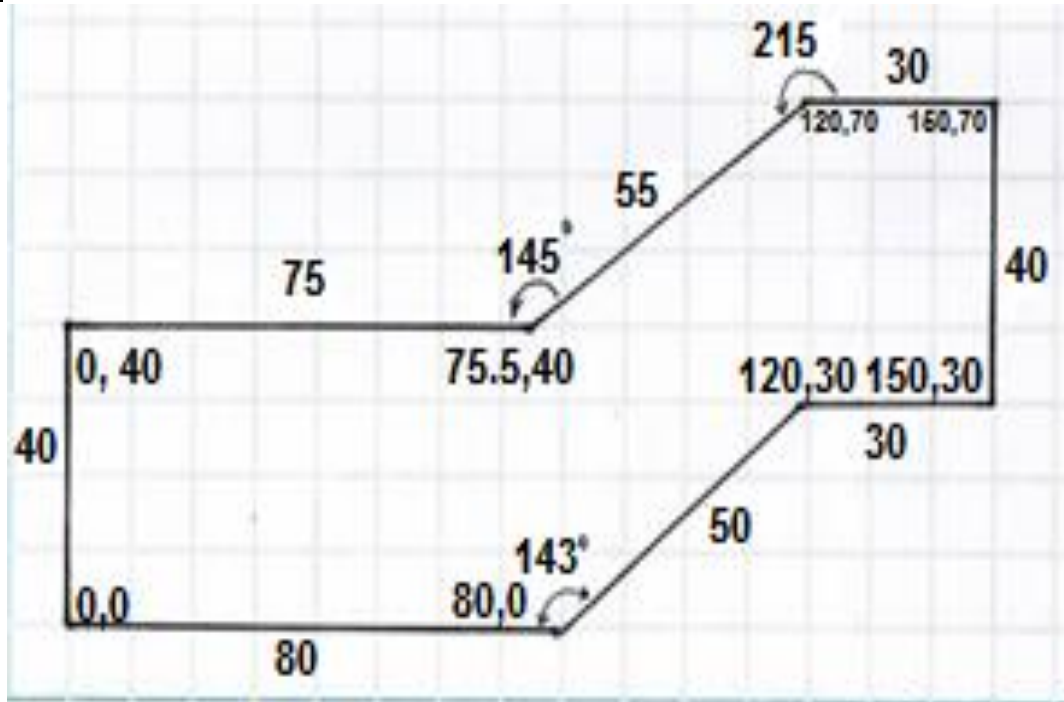
What are the orders needed for the computer to draw the following shape?

you can use any one of the following methods:

Absolute Coordinates,
Relative Coordinates or
Polar Coordinates.



Solution:



Absolute Coordinates

Line	↙
0,0	↙
80, 0	↙
120, 30	↙
150, 30	↙
150, 70	↙
120, 70	↙
75.5, 40	↙
0 , 40	↙
0 , 0	↙

Relative Coordinates

Line	↙
0,0	↙
@ 80 , 0	↙
@ 40 , 30	↙
@ 30 , 0	↙
@ 0 , 40	↙
@ -30 , 0	↙
@ 45 , -30	↙
@ -75 , 0	↙
@ 0 , -40	↙

Polar Coordinates

Line	↙
0,0	↙
@ 80 < 0	↙
@ 50 < 37	↙
@ 30 < 0	↙
@ 40 < 90	↙
@ 30 < 180	↙
@ 55 < 215	↙
@ 75 < 180	↙
@ 40 < 270	↙

0.5 cm Graph Paper

Two lines per centimeter. Black lines.

