Exercise 2.4:

Determine the dimensions of a four bars mechanism which allows to put a tool on the three holes of the following part:

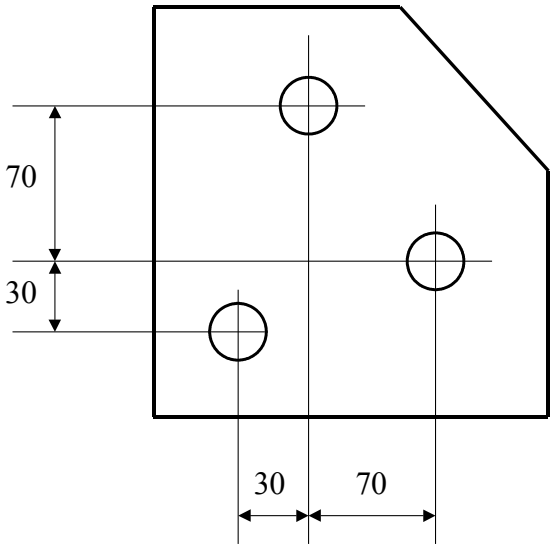
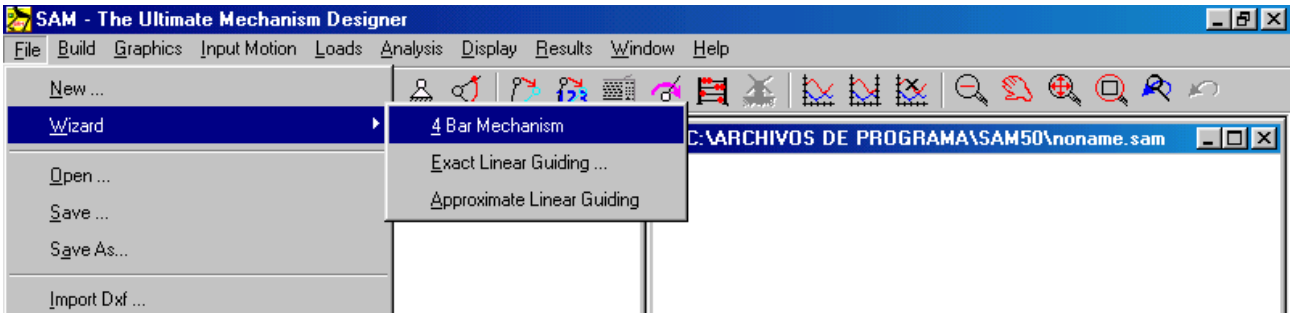


Figure E2.1.- Tooling holes in a part.

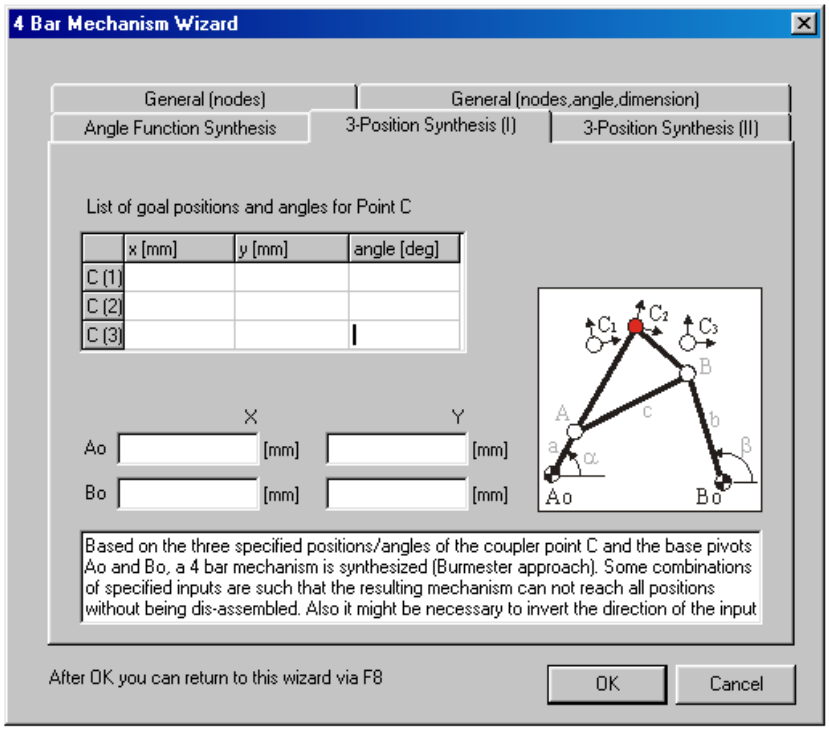
Solution:

a) The synthesis of mechanism will be solved using the SAM PC v5.0 program which applies the before delivered technique.

As shown in Exercise 1, SAM program provides a *"Wizard"* menu that also can be used in order to apply synthesis of trajectories:



We choose the "4 Bar Mechanism" option, and the "3-Position Synthesis (I)" flap. Then the following form appears:



Next step is to fill the coordinates and angles for the three points of precision, and the coordinates of the two fixed links, A_0 and B_0.

The coordinates of the three points of precision, (position of the three holes), is calculate from the position of the centre of the three holes, on a free chosen system of reference as shown in figure E2.2.:

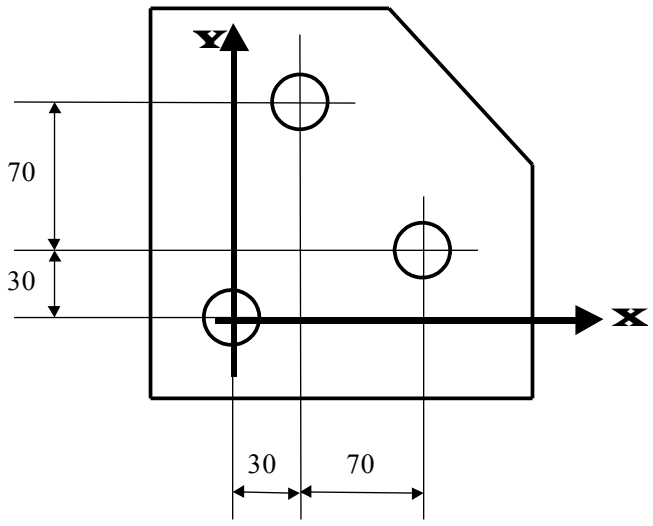


Figure E2.2.- System of reference which is used to calculate the coordinates of the three precision points.

Then the values of the coordinates of the three points of precision, (centre of the three holes), are:

	Punto 1	Punto 2	Punto 3
X	0	100	30
Y	0	30	100

Other information, angles and position of the fixed links A_0 and B_0, can be chosen freely. But the resultant mechanism can not be good. After trying some times, we can introduce the data that figure E2.3. shows:

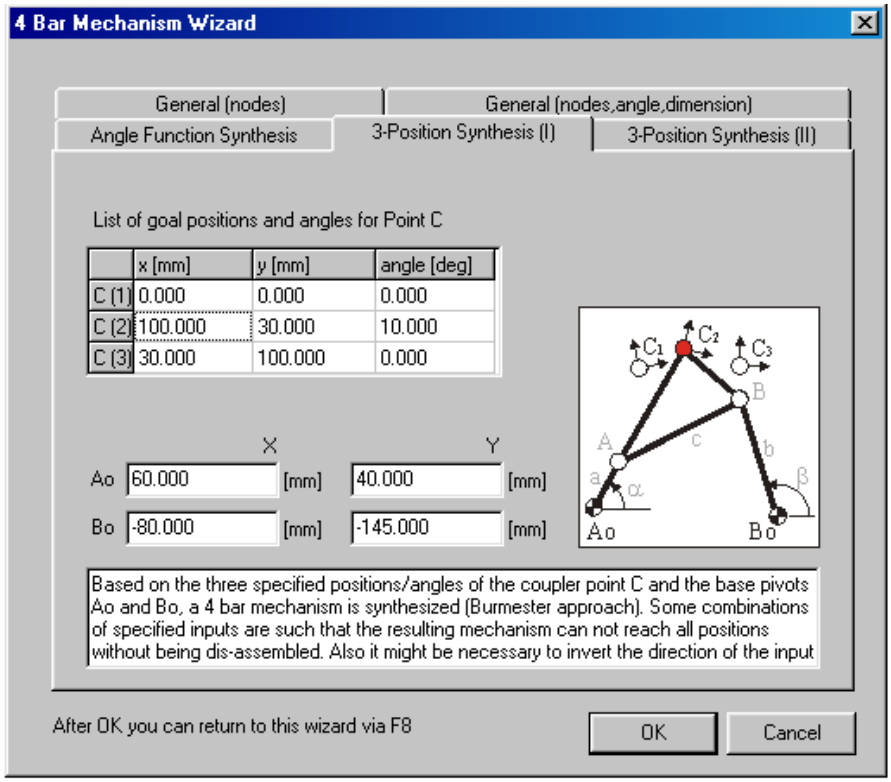
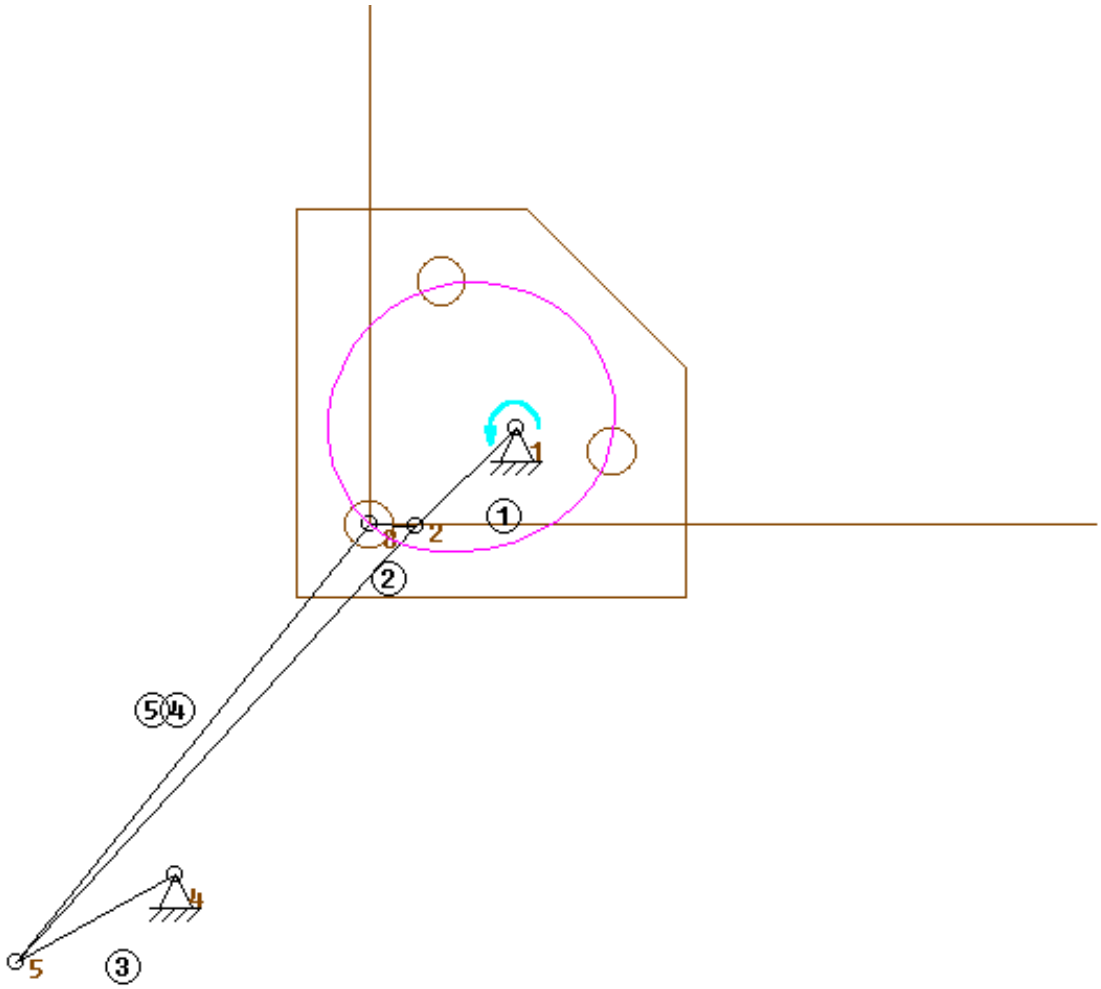


Figure E2.3.- Data input for the 3-Position synthesis (I).

Then “O.K.” is stroke and the solution appears, as follows:


1
2
3
4
5
①
②
③
④
⑤