

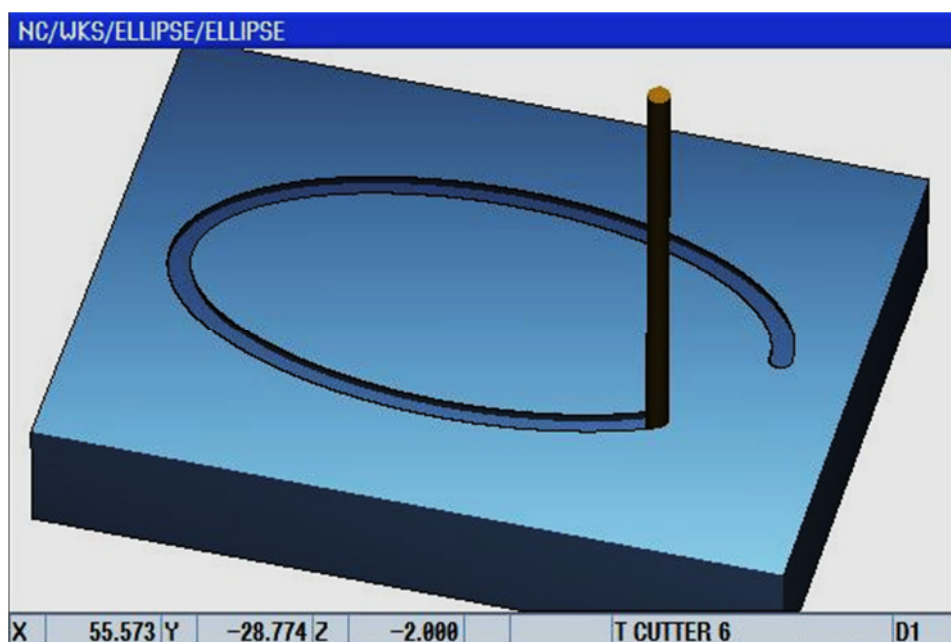


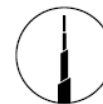
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Appendix 5: Programming on Siemens Control

Parametric programming of an ellipse

Paper Size: A4





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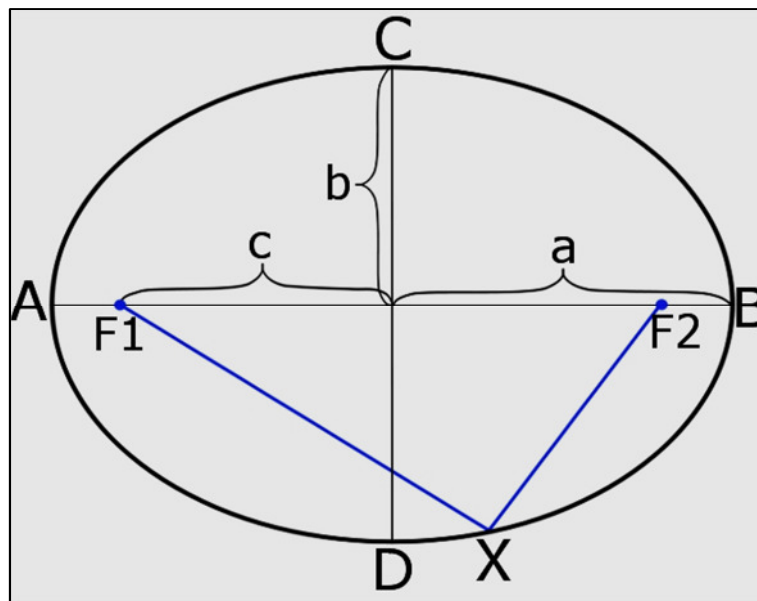


1 Introduction

An ellipse is described as follows: all the points belonging to an ellipse are equidistant from two fixed points called focal points.

The A-B segment is called the major axis.

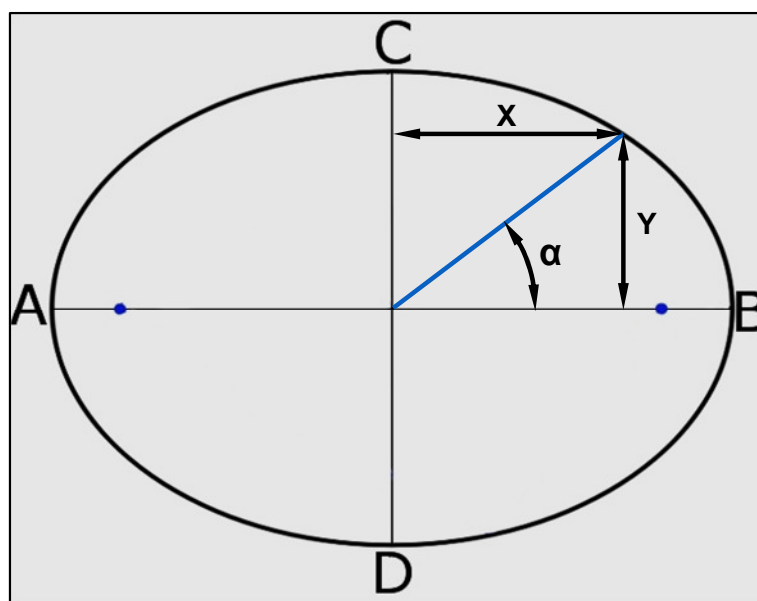
The C-D segment is called the minor axis.



Given the values of 'a' and 'b', the coordinates of any point lying on the ellipse can be calculated according to the following formulas:

$$X = a \cdot \cos(\alpha)$$

$$Y = b \cdot \sin(\alpha)$$





2 Programming

2.1 Programming example

```
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; blank part: centered parallelepiped
; W = 150 side length on Y
; L = 200 side length on X
; ZA = 0 position of upper face with respect to part zero point
; ZI = -32 position of lower face with respect to part zero point

;DIMENSIONS OF THE ELLIPSE
R1=40 ; LENGTH OF THE SEMI-MINOR AXIS
R2=80 ; LENGTH OF THE SEMI-MAJOR AXIS
R3=0 ; STARTING ANGLE OF THE PROFILE
; CALCULATION OF THE POSITION OF THE FIRST POINT
R5=R2*COS(R3)
R6=R1*SIN(R3)

WORKPIECE(,,, "RECTANGLE",0,0,-32,-150,200,150)
G17 G54 G90
G0 Z500

;TOOLING OPERATION
T="CUTTER 6" D1 M6 ; END MILL DIAM. 6
G95 S2000 M3 M8 F0.2
G0 X=R5 Y=R6 Z5
G1 Z-2 G94 F200
START1:
R3=R3+1 ; ANGULAR INCREMENT OF 1 DEGREE
STOPRE
R5=R2*COS(R3) ; X COORD. OF THE NEXT POINT
R6=R1*SIN(R3) ; Y COORD. OF THE NEXT POINT
STOPRE
G1 X=R5 Y=R6
IF R3<=360 GOTO START1
G1 Z5
G0 Z500
M30
```