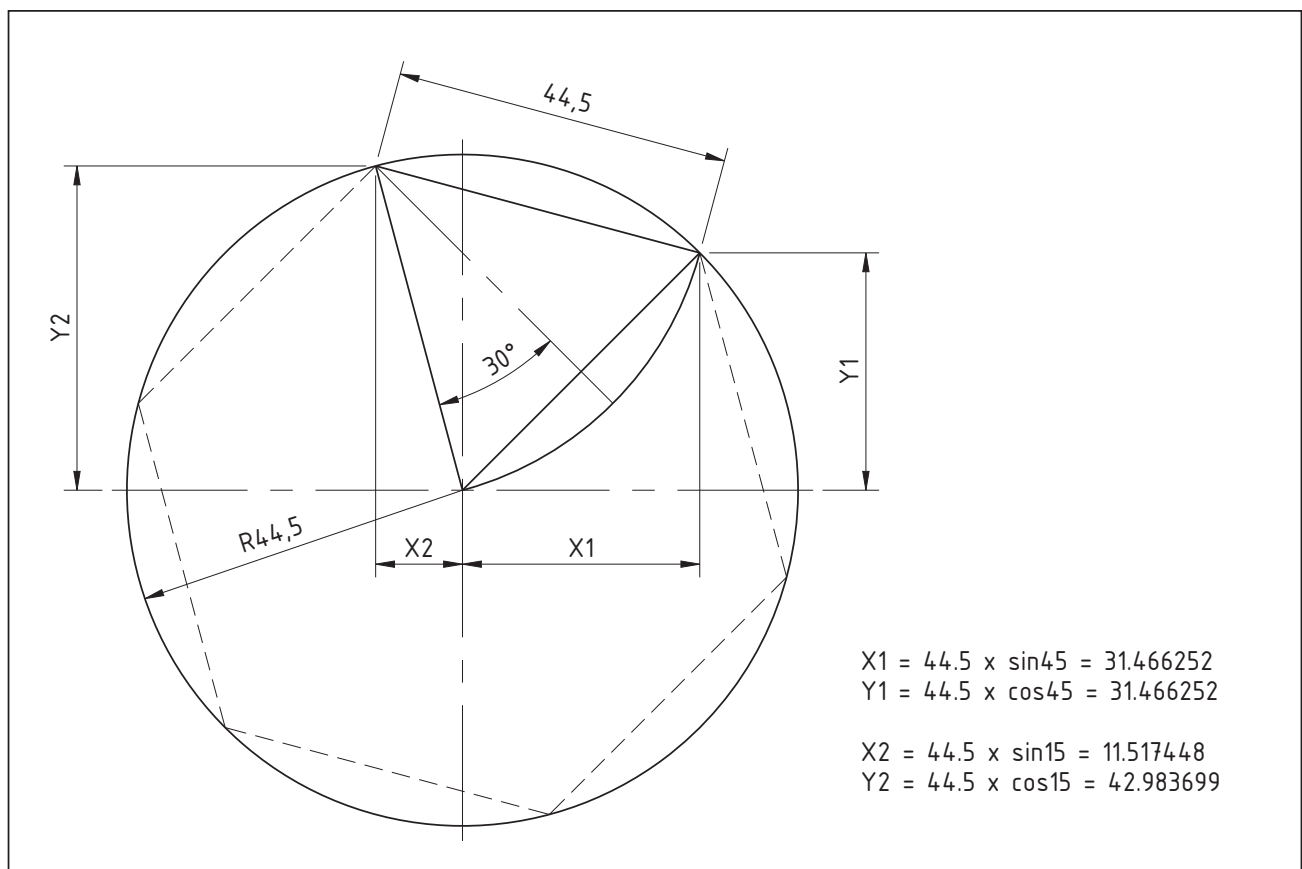


Circular Interpolation - Arcs

The key to calculating the X and Y end points and the I and J arc vectors is the fact that the radius of each arc is identical to the radius of the circle. The illustration below shows the concept for arc A . Only three calculations are required, as $X1=Y1$.

The two programs on the following page require only the three values for any arc, with different signs, of course.



For the XY coordinates on the circle circumference, the $X1$ and $Y1$ calculations are used. Center is $X0Y0$. For the I and J arc vectors, the $X2$ and $Y2$ calculations are used.

The programs are not intended for actual cutting, and the Z depth is zero. Also, the modal commands $G02$ and $G03$ were intentionally repeated for more emphasis.

➡ Exercise 29-02a:

(29-02A - G02 DIRECTION)

N1 G21	
N2 G17 G40 G80	
N3 G90 G00 X44.5 Y0	(START OF FULL CIRCLE)
N4 G43 Z5.0 H01	
N5 G01 Z0 F150.0	
N6 G02 I-44.5	(FULL CIRCLE)
N7 G00 Z5.0	
N8 X31.466 Y31.466	(START OF ARC A)
N9 G01 Z0	
N10 G02 X0. Y0. I-42.984 J11.517	(ARC A)
N11 G02 X31.466 Y31.466 I42.984 J-11.517	(ARC B)
N12 G00 Z5.0	
N13 X-31.466	(START OF ARC C)
N14 G01 Z0	
N15 G02 X0. Y0. I-11.517 J-42.984	(ARC C)
N16 G02 X-31.466 Y31.466 I11.517 J42.984	(ARC D)
N17 G00 Z5.0	
N18 Y-31.466	(START OF ARC E)
N19 G01 Z0	
N20 G02 X0. Y0. I42.984 J-11.517	(ARC E)
N21 G02 X-31.466 Y-31.466 I-42.984 J11.517	(ARC F)
N22 G00 Z5.0	
N23 X31.466	(START OF ARC G)
N24 G01 Z0	
N25 G02 X0. Y0. I11.517 J42.984	(ARC G)
N26 G02 X31.466 Y-31.466 I-11.517 J-42.984	(ARC H)
N27 G00 Z5.0	
N28 G28 Z5.0 M05	
N29 G28 X0 Y0	
N30 M30	
%	

➡ Exercise 29-02b:

(29-02B - G03 DIRECTION)

N1 G21	
N2 G17 G40 G80	
N3 G90 G00 X44.5 Y0	(START OF FULL CIRCLE)
N4 G43 Z5.0 H01	
N5 G01 Z0 F150.0	
N6 G03 I-44.5	
N7 G00 Z5.0	
N8 X0	(START OF ARC A)
N9 G01 Z0	
N10 G03 X31.466 Y31.466 I-11.517 J42.984	(ARC A)
N11 G03 X0 Y0 I11.517 J-42.984	(ARC B)
N12 G03 X-31.466 Y31.466 I-42.984 J-11.517	(ARC C)
N13 G03 X0 Y0 I42.984 J11.517	(ARC D)
N14 G03 X-31.466 Y-31.466 I11.517 J-42.984	(ARC E)
N15 G03 X0 Y0 I-11.517 J42.984	(ARC F)
N16 G03 X31.466 Y-31.466 I42.984 J11.517	(ARC G)
N17 G03 X0 Y0 I-42.984 J-11.517	(ARC H)
N18 G00 Z5.0	
N19 G28 Z5.0 M05	
N20 G28 X0 Y0	
N21 M30	
%	