

**Clotoïde: calculation x,y coordinates**

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The transition curve starts from a straight track with R=infinite  
 The end lies at point x,y where the length is L and the radius is R  
 The center of the circle with radius R lies at x=s  
 The clotoïde track can be calculated using the following formulas:  
 $r.l=ri.Li=A^2$   
 $Ri=A^2/Li$   
 The total angle alpha reached at the end point of the clotoïde  $\alpha=Li / (2.Ri)*(180/\pi)$  in degrees  
 L is the total length of the clotoïde and R is the radius at the end of L.

**Formulas from the website below:**

<https://pwayblog.com/2016/07/03/the-clothoid/>

Cartesian coordinates can be calculated using Euler integrals:

**Formulas:**

x,y	index 1	index 2	index 3	index 4
x =	L	- L <sup>5</sup> /(40*(RL) <sup>2</sup> )	+ L <sup>9</sup> /(3456*(RL) <sup>4</sup> )	- L <sup>13</sup> /(599040*(R*L) <sup>6</sup> ) + .....
y =	L <sup>3</sup> /(6*R*L)	- L <sup>7</sup> /(336*(R*L) <sup>3</sup> )	+ L <sup>11</sup> /(42240*(R*L) <sup>5</sup> )	- L <sup>15</sup> /(96768*(R) <sup>7</sup> ) + .....
s =	L <sup>2</sup> /(24*R)	- L <sup>4</sup> /(2668*R <sup>3</sup> )	+ .....	

**Input:**

L end	2,50	m
R end	1,00	m

**Calculations:**

steplength=L/10                      0,25    m  
 A    1,58    m  
 Total Angle                              71,62    degrees    **NOTE: This value should not be larger than 90 degrees!**

Li	Ri=A <sup>2</sup> /Li	x1	x2	x3	y1	y2	y3	x	y	x=s
0,25	10,00	0,25	0,0000	0,0000	0,0010	0,0000	0,0000	0,2500	0,0010	0,6510
0,5	5,00	0,5	0,0001	0,0000	0,0083	0,0000	0,0000	0,4999	0,0083	
0,75	3,33	0,75	0,0009	0,0000	0,0281	0,0000	0,0000	0,7491	0,0281	
1	2,50	1	0,0040	0,0000	0,0667	-0,0002	0,0000	0,9960	0,0665	
1,25	2,00	1,25	0,0122	0,0001	0,1302	-0,0009	0,0000	1,2378	0,1293	
1,5	1,67	1,5	0,0304	0,0003	0,2250	-0,0033	0,0000	1,4699	0,2217	
1,75	1,43	1,75	0,0657	0,0011	0,3573	-0,0096	0,0000	1,6855	0,3477	
2	1,25	2	0,1280	0,0038	0,5333	-0,0244	0,0000	1,8758	0,5090	
2,25	1,11	2,25	0,2307	0,0109	0,7594	-0,0556	0,0000	2,0303	0,7038	
2,5	1,00	2,5	0,3906	0,0283	1,0417	-0,1163	0,0000	2,1376	0,9254	

To make the x and y scale equal:

Click and drag the corner to equalize both scales

