

CIRCULAR CURVE EQUATIONS

Symbol	Equation	Unit
* L	= R Δ (0.017453293)	Feet
* T	= R tan $\frac{\Delta}{2}$	Feet
* E	= $\frac{R}{\cos \frac{\Delta}{2}} - R$, also = R exsec $\frac{\Delta}{2}$	Feet
* C	= 2 R sin $\frac{\Delta}{2}$, also = 2 R sin DC	Feet
* MO	= R (1 - cos $\frac{\Delta}{2}$), also = R vers $\frac{\Delta}{2}$	Feet
DC	= $\frac{\Delta}{2}$	Degrees
**dc	= $\frac{L_c}{L} \left(\frac{\Delta}{2}\right)$	Degrees
C'	= 2 R sin dc	Feet
tx	= (2 R sin dc) (cos dc), also = R sin 2 dc	Feet
ty	= (2 R sin dc) (sin dc), also = R vers 2 dc	Feet

* Values of L, T, E, C, and MO may be conveniently obtained by using the table "Functions of a 10,000-ft. Radius Curve". Multiply tabular values by R/10,000.

Example, Given: $\Delta = 25^\circ 33'$
 $R = 3000'$

$$\begin{aligned}
 L &= (0.3) (4459.316) = 1337.79' \\
 T &= (0.3) (2267.356) = 680.21' \\
 E &= (0.3) (253.823) = 76.15' \\
 C &= (0.3) (4422.460) = 1326.74' \\
 MO &= (0.3) (247.541) = 74.26'
 \end{aligned}$$

The table "Arc Lengths for Radius = 1" is helpful when calculating L.

Add tabular values for degrees, minutes, and seconds of Δ and multiply by R.

**Refer to table "Deflections and Chords for Radius Curves".