

Answers to "Test Yourself" No. 15

Compute the Curve Parts

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First the two "deltas":

$$\Delta_1 = 58^\circ 08' 30''$$

$$\Delta_2 = 85^\circ 50' 50''$$

$$a/R = \tan\left(\frac{58^\circ 08' 30''}{2}\right)$$

$$a = 0.555926R$$

$$b/R = \tan\left(\frac{85^\circ 50' 50''}{2}\right)$$

$$b = 0.930026R$$

The tangents for Δ_1 plus Δ_2 , summed, has to equal 430.00 feet.

$$430.00 = a + b = 0.555926R + 0.930026R$$

$$R = 289.38'$$

Now the curve parts for the curve:

$$\Delta = 143^\circ 59' 20''$$

$$D = 19^\circ 47' 58''$$

$$T = R \tan\left(\frac{\Delta}{2}\right) = (289.38) \tan\left(\frac{143^\circ 59' 20''}{2}\right) = 890.33'$$

$$L = R\Delta\left(\frac{\pi}{180}\right) = (289.38) (143^\circ 59' 20'') \left(\frac{\pi}{180}\right) = 727.235'$$

$$LC = 2R \sin\left(\frac{\Delta}{2}\right) = 2(289.38) \sin\left(\frac{143^\circ 59' 20''}{2}\right) = 550.42'$$

$$M = R\left(1 - \cos\left(\frac{\Delta}{2}\right)\right) = 289.38\left(1 - \cos\left(\frac{143^\circ 59' 20''}{2}\right)\right) = 199.93'$$

$$E = R\left(\frac{1}{\cos\left(\frac{\Delta}{2}\right)} - 1\right) = 289.38\left(\frac{1}{\cos\left(\frac{143^\circ 59' 20''}{2}\right)} - 1\right) = 646.79'$$