Solutions #7

Dear CVG 2171 students,

Below are the solutions to the last assignment. You may contact your TA, if anymore explanation is needed.

1- Below is the calculation for the circular curve.

PI	36+45.00
D_c	4
D_a	
R	1432.68
I	24
L	600
T	304.53
E	32.01
M	31.31
LC	595.74
PC	33+40.47
PT_{Back}	42+45.00

2-

```
                Intersection Angle = 25°46'59"
               Degree of Curvature = 2°54'38"
                            Radius = 600.000
          Circular Curve Length = 270.000
               Tangent Distance = 137.325
     Circular Curve Long Chord = 267.728
                Middle Ordinate = 15.124
                        External = 15.515
                  PI Stationing = 4+350.000
                  4+482.675 Back = 4+487.325 Ahead
```

Station	Chord	Defl. Increment	Defl. Angle
4+482.675	12.675	0°36'19"	12°53'30"
4+470.000	29.997	1°25'57"	12°17'11"
4+440.000	29.997	1°25'57"	10°51'14"
4+410.000	29.997	1°25'57"	9°25'18"
4+380.000	29.997	1°25'57"	7°59'21"
4+350.000	29.997	1°25'57"	6°33'24"
4+320.000	29.997	1°25'57"	5°07'28"
4+290.000	29.997	1°25'57"	3°41'31"
4+260.000	29.997	1°25'57"	2°15'35"
4+230.000	17.325	0°49'38"	0°49'38"
4+212.675			

3-

$$R = \frac{85}{\tan\frac{13°20'}{2}} = 727.221 \text{ m, so round to } 730 \text{ m.}$$

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                Intersection Angle = 13°20'00"
               Degree of Curvature = 2°23'32"
                            Radius = 730.000
          Circular Curve Length = 169.879
               Tangent Distance = 85.325
     Circular Curve Long Chord = 169.496
                Middle Ordinate = 4.936
                        External = 4.970

                  PI Stationing = 6+356.400
                  6+440.954 Back = 6+441.725 Ahead
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Station	Chord	Defl. Increment	Defl. Angle
6+440.954	20.953	0°49'20"	6°40'00"
6+420.000	29.998	1°10'38"	5°50'40"
6+390.000	29.998	1°10'38"	4°40'01"
6+360.000	29.998	1°10'38"	3°29'23"
6+330.000	29.998	1°10'38"	2°18'45"
6+300.000	28.923	1°08'06"	1°08'06"
6+271.075			

4- By Equation 24.24:

$$C = \sqrt{8(10)600} = \mathbf{219\ m}$$

Good luck,