

**Solutions #1**

Dear CVG 2171 students,

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

1-

$$F = 1000 \sqrt{\frac{30}{0.0206}} = 38,161 \text{ ft} = 7.228 \text{ mi}$$

2-

$$K = \sqrt{\frac{1.5}{0.0675}} + \sqrt{\frac{10}{0.0675}} = 16.886 \text{ km}$$



3-

NOTE: The elevation of BM 7 should be 852.045ft.

POINT	+S (BS)	-S (FS)
BM 7	9.432	
TP 1	6.780	8.363
BM 8	7.263	9.822
TP 2	3.915	9.400
TP 3	7.223	5.539
BM 7		1.477

STA	+	HI	-	ELEV
BM 7	9.432			852.045
		861.477	(-0.0024)	(853.112)
TP 1	6.780		8.363	853.114
		859.894	(-0.0048)	(850.067)
BM 8	7.263		9.822	850.072
		857.335	(-0.0072)	(847.928)
TP 2	3.915		9.400	847.935
		851.85	(-0.0096)	(846.301)
TP 3	7.223		5.539	846.311
		853.534	(-0.0120)	(852.045)
BM 7			1.477	852.057
	34.613		34.601	
Page check	852.045 + 34.613 - 34.601			852.057
Misclosure =	852.057 - 852.045		0.012	
Correction =	-0.012/5 =	-0.0024		

From Equation 5.3: $m = 12 \text{ mm} / \sqrt{0.5} = 9.8 \text{ mm}$, **third order**



4-

Sta	+sight	HI	-sight	Elev	Adj. Elev	Corr.
HYDRANT	2.65			4823.65	4823.65	
		4826.30				
TP1	7.23		3.51	4822.79	4822.80	0.010
		4830.02				
BM1	11.41		5.04	4824.98	4825.00	0.020
		4836.39				
BM2	7.65		8.58	4827.81	4827.84	0.030
TP2	7.53		4.23	4831.23	4831.27	0.040
		4838.76				
ROCK			4.34	4834.42	4834.47	0.050
sum	36.47		25.70			

Misclosure: $4834.42 - 4834.47 = -0.05$ Page Check: $4823.65 + 36.47 - 25.70 = 4834.42$

5-

$$\text{From A: } \Delta E_{lev_{AB}} = \frac{4.928 + 4.924 + 4.926}{3} - 1.365 = 4.926 - 1.365 = 3.561$$

$$\text{From B: } \Delta E_{lev_{AB}} = 4.251 - \frac{0.687 + 0.688 + 0.689}{3} = 4.251 - 0.688 = 3.563$$

$$E_{lev_B} = 564.872 - \frac{3.561 + 3.563}{2} = 564.872 + 3.562 = \mathbf{568.434 \text{ m}}$$

Good Luck,

