Université d'Ottawa
Faculté de génie

Département de
Génie Civil

uOttawa
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University of Ottawa
Faculty of Engineering

Department of
Civil Engineering

CVG 2171: Mid-Term Examination
Thursday, March 8, 2012

Prof. André Skaff

Exam duration: 1h:20m
Closed Book Examination

Question 1 (10 Points)

a) Prepare a set of level notes for the data shown below: The elevation of BM 100 is 231.456 m.

b) Determine the error of misclosure and make the usual arithmetic check.

c) Adjust the elevations of BM101, BM102 and BM103 assuming that the error es equally divided among set-ups.

Station	BS	FS
BM100	1.317	
TP1	1.650	0.814
TP2	1.491	2.050
BM101	1.832	1.286
TP3	1.322	0.839
TP4	0.983	1.324
TP5	0.645	1.635
BM102	1.729	1.493
BM103	1.237	1.116
TP6	1.269	1.588
BM100		1.320

Question 2 (10 Points)

A 100 ft steel tape weighs 2 lb, has a cross-sectional area of 0.006 in² and is 100 ft long at 68°F when subjected to a 12 lb pull and supported throughout its entire length. In the field, a distance was measured with this tape and found to be 688.32 ft long. If, at the time of measurement the pull on the tape was 20 lb, the temperature was 88°F and the tape was supported at its ends only, what is the correct distance measured? Assume all full tape length except the last one.

The coefficient of thermal expansion and contraction of steel is K=0.0000065 per unit length per degree Fahrenheit and its Modulus of Elasticity is $E=29\times10^6$ pounds per in².

Question 3 (10 Points)

Given the following data for a closed traverse ABCDEA:

Compute the length and the azimuth of line DE.

Segment	Length (m)	Azimutth
AB	309.72	86° 41'
BC	201.44	89° 33'
CD	235.70	204° 24'
DE	Unknown	Unknown
EA	359.10	316° 32'