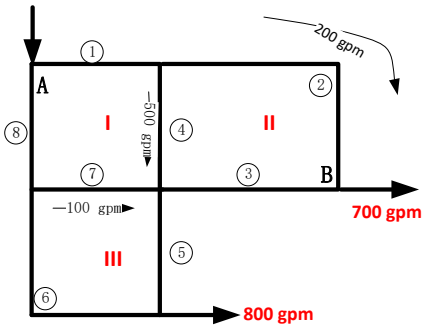
FPST 2483 Lab #10 Name:_____

OBJECTIVES:

This laboratory unit is designed to practice Hardy-Cross method with problems of multiple loops. All problems are supposed to be solved with Hardy-Cross Method using attached spreadsheets.

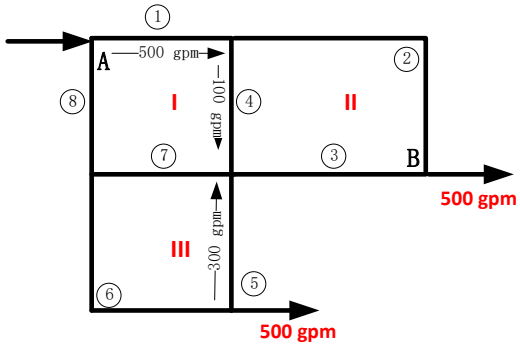
1. Based on the following topology, find the following flows in different sections and mark them in the diagram.

a.



	No	flow
Loop I	1	
	4	
	7	
	8	
Loop II	2	
	3	
	4	
Loop III	5	
	6	
	7	
Loop IV (imaginary loop)	1	
	2	
	3	
	5	
	6	
	8	

b.



	No	flow
Loop I	1	
	4	
	7	
	8	
Loop II	2	
	3	
	4	
Loop III	5	
	6	
	7	
Loop IV (imaginary loop)	1	
	2	
	3	
	5	
	6	
	8	

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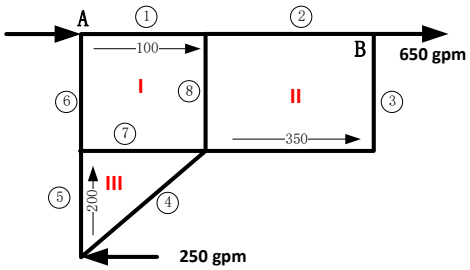
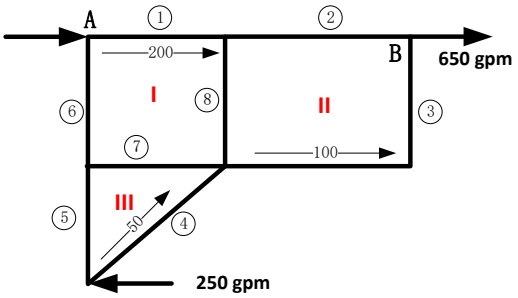
Name:_____



c.

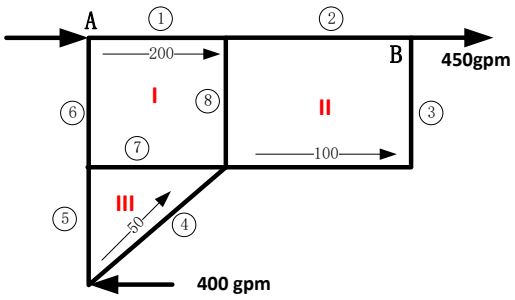
	No	flow
Loop I	1	
	6	
	7	
	8	
Loop II	2	
	3	
	8	
Loop III	4	
	5	
	7	
Loop IV (imaginary loop)	1	
	2	
	3	
	4	
	5	
	6	



d.

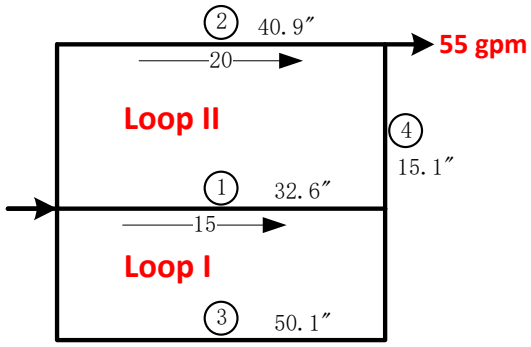
	No	flow
Loop I	1	
	6	
	7	
	8	
Loop II	2	
	3	
	8	
Loop III	4	
	5	
	7	
Loop IV (imaginary loop)	1	
	2	
	3	
	4	
	5	
	6	

e.



	No	flow
Loop I	1	
	6	
	7	
	8	
Loop II	2	
	3	
	8	
Loop III	4	
	5	
	7	
Loop IV (imaginary loop)	1	
	2	
	3	
	4	
	5	
	6	

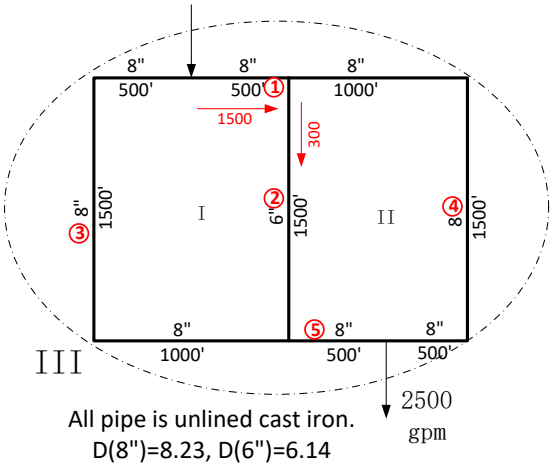
f.



	No	flow
Loop I	1	
	3	
Loop II	1	
	2	
	4	
Loop III (imaginary loop)	2	
	3	
	4	

2. Hardy-Cross method for 2-loop network.

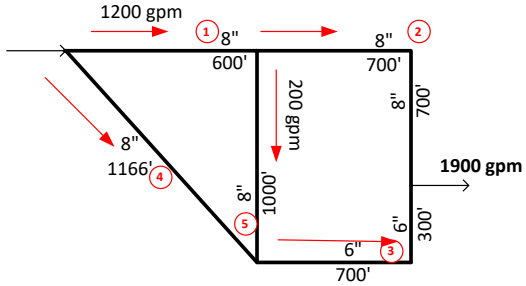
a. Work the following Hardy-Cross problem through the first correction. Be sure to assign all the signs to the flows and fill in all the open boxes. Note that the magnitude (but not the sign) of some of the flows have already be estimated for you. Use Nominal pipe diameters.



All pipe is unlined cast iron.
D(8")=8.23, D(6")=6.14

Loop No.	Line No.	Size	C-Factor	Length	Q (gpm)	P_f (psi)	$\frac{1.85P_f}{Q}$	Correc-tion	Q (gpm)	P_f (psi)	$\frac{1.85P_f}{Q}$	Correc-tion	Q (gpm)	P_f (psi)	$\frac{1.85P_f}{Q}$	Correc-tion

b. Set up the worksheet for solution of the complex loop problem and work through the first correction. Note that all loops and legs have already been labeled for you and have been indicated on the attached work sheet. Also, two of the initial flow estimates have been given. For these two, simply indicate the proper sign notation. Use nominal pipe diameters.



All 8" pipe is unlined cast iron (8.23").
All 6" pipe is unlined cast iron (6.14").

Loop No.	Line No.	Size	C-Factor	Length	Q (gpm)	P_f (psi)	$\frac{1.85P_f}{Q}$	Correc-tion	Q (gpm)	P_f (psi)	$\frac{1.85P_f}{Q}$	Correc-tion	Q (gpm)	P_f (psi)	$\frac{1.85P_f}{Q}$	Correc-tion