Math F113X: Quiz 1

There are 10 points possible on this quiz. No aids (book, notes, etc.) are permitted. You may use a non-programmable calculator. Show all work and supporting calculations for full credit. Explain how you get your answers.

score: / 10

1. (5 points) The student government is holding elections for president. There are four candidates (A,B,C and D for convenience). The preference schedule is below.

number of voters	70	60	50	110	10		
1st choice	C	В	C	D	Α		
2nd choice	D	Α	Α	В	C		
3rd choice	B	D	B	С	B		
4th choice	A	C	D	Α	D		
(a) How many voters voted in this election? 300							
70160150110110 = 300							
(b) How many voters are needed for a majority?S l							
300 = 150 but can't have exactly 50%							
(c) How many vot	tes are	e nee	ded f	or a pl	uralit	y?7 b	
(d) Find a winner under the plurality method							
Considering 12t place votes only:							
A = 10							
R = 60							
= JOHED = 120 A C not the most 12							
C = T	τU	,					
D = 11	0					place votes.	

number of voters	70	60	50	110	10
1st choice	C	В	C	D	А
2nd choice	D	Α	Α	В	С
3rd choice	B	D	В	С	В
4th choice	A	C	D	А	D

2. (5 points) Below is the same preference schedule.

(a) In a one-to-one comparison, who is preferred candidate A or candidate D? (You must show your calculation.)



(b) Explain why A cannot be the Condorcet winner.

(c) Show that candidate *D* is the Condorcet winner. (You must show your work.)

D vs C	Drc B	A/B B/C A/C IR/DI
70 60 50 110 10	0 60 50 10 0	A/D C/D
C D C D C D C D C D	B D D B C	
C: 70 + 50 + 10 = 130 D: 60 + 10 = 011 + 60 + 0 D wins	D: 70 + 110 = 180 B: 60 + 50 + 10 = 120 Dwins.	

So D wins all their head to head matchings and therefore is the conducter winner.