Math 6
Worksheet 8
Due Friday May 19

Please discuss the following questions with your assigned groups. You may take notes on all items you discuss with your classmates, however you are to write up your solutions independently of one another and without assistance. Your solutions should be written up carefully and neatly on a separate sheet of paper. You should write in **complete sentences** and ***explain all steps taken and tools used (such as theorems or results from class) in reaching your final answers***. Please also include at the top of your write-up a list of people with whom you discussed these problems.

Suppose that in an election with three candidates (A, B, and C) and 100 voters, the preferences of the voters are as follows:

>   40 like A best, B second best, and C least.
>   28 like B best, C second best, and A least.
>   32 like C best, B second best, and A least.

We could diagram this information as follows:

40	28	32
A	B	C
B	C	B
C	A	A

Using our traditional method of voting, where the candidate with the highest number of votes wins, A would win, even though 60 of the voters like B better than A and 60 voters like C better than A.

The following questions are designed to get you thinking about voting and set the stage for talking about different methods of voting. There is no single correct answer.

- Should A win?
- Which candidate do you think would make the best choice? Why?

Describe *two different methods* of analyzing the votes above that will produce a winner other than A. For each of these methods, answer the following questions:

- Will this method produce as a winner the same candidate you thought would make the best choice?
- If it does, can you come up with a scenario (that is, a list of voters' preferences with three or more candidates) in which this method does *not* produce as a winner the candidate that intuitively would make the best choice? In other words, is there a scenario in which you might not want to use this method?
- If neither of your methods produces as a winner the candidate you would like, can you come up with another method which would?