

MA111: Contemporary mathematics

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Entrance Slip (due 5 min past the hour):

- How many voters are in the following election:

	7	6	5
1st	A	B	C
2nd	D	D	D
3rd	B	C	B
4th	C	A	A

- How many candidates are in the election?

Schedule:

- Exam 1 is Monday, Sep 17th, during class.

Today we present practice exam questions at the board.

Context: Conclusion and Arrow's theorem

- The exam has four main parts:
 - Matching: no need to show work. If you've studied, this is like a formulas sheet. If not, then it is a hopeless labyrinth guaranteed to drop you two letter grades.
 - Counting: you must clearly show your work. Use a complete sentence. "A wins plurality because it has the most first place votes (A:4, B:3, C:2, D:2)."
 - Strategy: you should briefly show your work, but clearly describe why the voters are happier after their change. "If they vote honestly, then their least favorite candidate A wins (A:4, B:3, C:2, D:2), but if they vote $B > C > D > A$, then their second favorite B wins (A:4, B:5, C:0, D:2)."
 - Fairness:
 - if it CAN happen, show it DOES happen (give a preference schedule).
 - if it cannot happen, then explain why it can never happen.

Activity: Practice exam presentations

- Spend a few minutes picking your answers.
- Four people will come to the board to explain the counting.
- Next four people will explain strategy.
- Finally four people will explain fairness.
- We'll examine the answers and identify the good parts and the parts to improve.

Assignment and exit slip

- Study:
 - Understand the practice exam
 - Reread the chapter
 - Redo all the entrance and exit slips
- **Exit slip:** What is the difference between a majority winner and a plurality winner?
- Give an example where the plurality winner is not a majority winner.

Entrance/exit slip answers

- Entrance: There are $7+6+5$ voters. There are 4 (A,B,C,D) candidates.
- Exit: Majority winner has more than half first place votes, plurality winner has the most first place votes.

Majority winners should win. The plurality method says that plurality winners do win.

A majority winner has more first place votes than the rest of the candidates combined.

A plurality only has more if they stay separated.