

Voting Methods

Method 1--**The Plurality Method**: The candidate or choice with the most number of votes wins. There is no need for a majority.

Method 2--**The Majority Rules Method**: A candidate or choice must obtain more than 50% of the vote to win an election.

Method 3--**The Borda Count Method**: All candidates or choices are ranked by voters from most favored to least favored. Points are awarded based upon ranking. If there are 5 candidates, first place is worth 5 points, second place is worth 4 points, third place 3 points, fourth place 2 points, and fifth place 1 point.

Method 4—**The Condorcet Candidate**: The candidate or choice that is that favored over every other candidate in a head-to-head battles should win the election.

The Condorcet Jury Theorem

If the probability that each voter will choose the better alternative is greater than one-half, then the probability that the group will choose the better alternative increases with the number of voters.

GUILTY VS. NOT GUILTY

Part II: Voting Method Examples

- Albert, Barbara and Cecil are the only three candidates running for president of the Class of 2009 at a local high school. All class members can vote for one of the three. If Albert receives 27 votes and Barbara has 32 votes, how many votes must Cecil get to win the election using plurality as the voting method?

ALBERT = 27 BARBARA = 32 CECIL = 33 VOTES!

- Sam, Ben, and Sally are running for class representative for an SCA election. If Sam gets 200 votes and Ben gets 314 votes, how many will Sally need to win the election if the voting method is Majority Rules?

SAM = 200 } 514 VOTES SALLY = 515 VOTES
 BEN = 314

- If the Majority Rules method is used in an election, how many more votes are needed to win an election if a candidate receives 150 and 400 people voted in the election?

400 VOTES = 201 VOTES 150 VOTES + 51 VOTES = 201

- A club with nine members decided to elect its president using a Borda Count Method. Three candidates, A, B, C ran for office. The votes were tallied and each voters rankings are listed as follows:

	✓	✓	✓	✓	✓	✓	✓	✓	
Member	1	2	3	4	5	6	7	8	9
Ranking	BCA	CBA	BAC	BAC	BCA	ACB	ABC	CBA	CBA

Who wins this election and why?

ALLISON : 1 + 1 + 2 + 2 + 1 + 3 + 3 + 1 + 1 = 15 PTS

BARB : 3 + 2 + 3 + 3 + 3 + 1 + 2 + 2 + 2 = 21 PTS ✓

CATIE : 2 + 3 + 1 + 1 + 2 + 2 + 1 + 3 + 3 = 18 PTS

- In the above problem, what is the maximum number of points any candidate could have received?

9 VOTERS x 3 POINTS = 27 POINTS

6. A club with 5 members will elect a president using the **Pair-Wise Comparison Method**. Three candidates, A, B, C are running for office. The members voted as follows:

Member	1	2	3	4	5
Preferences	B ≻ A A ≻ C C ≻ B	A ≻ B A ≻ C C ≻ B	A ≻ B A ≻ C C ≻ B	B ≻ A A ≻ C C ≻ B	A ≻ B A ≻ C B = C

POINTS ANDY: $\frac{1}{2} + \frac{1}{2} + 1 + 1 + 1 + \frac{1}{2} + 1 + 1 = 6.5$ ✓

POINTS BEN: $\frac{1}{2} + 1 + \frac{1}{2} + 1 + \frac{1}{2} = 3.5$

POINTS CHARLIE: $\frac{1}{2} + 1 + \frac{1}{2} + 1 + \frac{1}{2} + 1 + \frac{1}{2} = 5$

7. Four candidates, A, B, C, D are running for an office within a church. The following information was obtained from the vote of the congregation.

Rankings	ABCD	BCAD	CDBA	DCBA
Number Of Voters	2	49	48	1

$2 + 49 + 48 + 1 = 100$ VOTERS

Who wins the election using the **Borda Count Method**?

POINTS ANDY: $2(4) + 49(2) + 48(1) + 1(1) = 155$

POINTS BARB: $2(3) + 49(4) + 48(2) + 1(2) = 300$

POINTS CATIE: $2(2) + 49(3) + 48(4) + 1(3) = 346$ ✓

POINTS DON: $2(1) + 49(1) + 48(3) + 1(4) = 199$

Who wins the election using the **Plurality method**?

A = 2 B = 49 ✓ C = 48 D = 1

Who wins the election using the **Majority Rules Method**? = 51 VOTES

A = 2 B = 49 C = 48 D = 1 NO BORDA

Who is the **Condorcet Candidate**?

A VS. B

A	VS.	B
↓		↓
2	✓	49
		48
		1

B WINS

B VS. C

B	VS.	C
↓		↓
2	✓	48
+ 49		+ 1
51		49

B WINS

B VS. D

B	VS.	D
↓		↓
2		48
+ 49		+ 1
51		49

B WINS

B WINS