

Number of Voters	21	19	15	11	6
1 st Choice	A	C	D	B	B
2 nd Choice	C	E	B	C	E
3 rd Choice	D	B	A	A	A
4 th Choice	E	D	C	D	D
5 th Choice	B	A	E	E	C

1. Determine the winner using the Plurality Method.

A, 21 votes

2. Determine the winner using the Borda Method.

A - 105 + 19 + 45 + 33 + 18 = 220

B - 21 + 57 + 60 + 55 + 30 = 223

C - 84 + 95 + 30 + 44 + 6 = 259

D - 63 + 38 + 75 + 22 + 12 = 210

E - 42 + 76 + 15 + 11 + 24 = 168

C wins

3. Determine the winner using the Plurality with Elimination Method.

Total votes: 72

B

4. Determine the winner using the Pairwise Comparison Method.

A vs. B - 21 to 57 (B)

A vs. C - 42 to 30 (A)

A vs. D - 38 to 34 (A)

A vs. E - 47 to 25 (A)

B vs. C - 32 to 40 (C)

B vs. D - 36 to 36 (5B) (5D)

B vs. E - 42 to 30 (B)

C vs. D - 57 to 21 (C)

C vs. E - 66 to 6 (C)

D vs. E - 47 to 25 (D)

A - 3 D - 1.5

B - 2.5 E - 0

C - 3

A + C tie!

5. Do any of the methods violate the majority criterion? Explain.

Borda + Plurality w/ Elimination

6. Do any of the methods violate the Condorcet criterion? Explain.

Plurality w/ Elimination

7. Complete the table of extended results.

Method	1 st Place	2 nd Place	3 rd Place	4 th Place	5 th Place
Plurality	<i>A</i>	<i>C</i>	<i>B</i>	<i>D</i>	<i>E</i>
Borda	<i>C</i>	<i>B</i>	<i>A</i>	<i>D</i>	<i>E</i>
Elimination	<i>B</i>	<i>A</i>	<i>C</i>	<i>D</i>	<i>E</i>
Pairwise	<i>A/C</i>	<i>B</i>	<i>D</i>	<i>E</i>	

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2 nd Choice	C	E	B	C	E
3 rd Choice	D	B	A	A	A
4 th Choice	E	D	C	D	D
5 th Choice	B	A	E	E	C

8. If B is eliminated, what is the new preference schedule?

	21	19	15	11	6
1 st	A	C	D	C	E
2 nd	C	E	A	A	A
3 rd	D	D	C	D	D
4 th	E	A	E	E	C

a) Who is the plurality winner with B eliminated?

C

b) Who is the Borda method winner with B eliminated?

$$\begin{aligned}
 A &= 84 + 19 + 45 + 33 + 18 = 199 \\
 C &= 63 + 76 + 30 + 44 + 6 = 219 \\
 D &= 42 + 38 + 60 + 22 + 12 = 174 \\
 E &= 21 + 57 + 15 + 11 + 24 = 128
 \end{aligned}$$

C

c) Who is the plurality with elimination winner with B eliminated?

A

d) Who is the pairwise comparison winner with B eliminated?

$$\begin{aligned}
 A \text{ vs. } C &= 42 \text{ to } 30 - A \text{ 1pt.} \\
 A \text{ vs. } D &= 48 \text{ to } 24 - A \text{ 1pt} \\
 A \text{ vs. } E &= 47 \text{ to } 25 - A \text{ 1pt.} \\
 C \text{ vs. } D &= 51 \text{ to } 21 - C \text{ 1pt} \\
 C \text{ vs. } E &= 66 \text{ to } 6 - C \text{ 1pt} \\
 D \text{ vs. } E &= 47 \text{ to } 25 - D \text{ 1pt}
 \end{aligned}$$

A

e) Do any of the methods violate the Independence of Irrelevant Alternatives Criterion?

Plurality

9. Let's say that the 15 people who voted for D first change their mind and vote for B instead. What method(s) could you check for violations of the monotonicity criterion?

none, bc. D was not the winner of any