

## Voting Methods

In Exercises 1-6, the spirit club at Lakeview High School is voting for President, Vice President, and Treasurer. Their choices are Ken Walters (KW), Jocelyn Suthers (JS), and Amelia Crest (AC). The preference table follows.

<b>Number of Votes</b>	<b>8</b>	<b>5</b>	<b>4</b>	<b>3</b>
<b>First</b>	KW	JS	AC	AC
<b>Second</b>	JS	KW	KW	JS
<b>Third</b>	AC	AC	JS	KW

1. How many members of the spirit club voted?
2. Does any choice have a majority of votes?
3. Determine the winner using the plurality method.
4. Determine the winner using the Borda count method.
5. Determine the winner using the plurality method with elimination method.
6. Determine the winner using the pairwise comparison method.
7. The Spirit Club is also given the responsibility of picking the new school color. The choices are Navy Blue (N), Maroon (M), and Gold (G). The results of the election are given in the following preference table.

<b>Number of Votes</b>	<b>5</b>	<b>6</b>	<b>3</b>	<b>6</b>
<b>First</b>	N	N	M	G
<b>Second</b>	M	G	N	M
<b>Third</b>	G	M	G	N

- a. Which color wins this election if the plurality method is used?
- b. Which color wins this election if the Borda count method is used?
- c. Which color wins this election if the plurality with elimination method is used?
- d. Which color wins this election if the pairwise comparison method is used?

In Exercises 1-6, the third graders at Parkside Elementary are voting for a dessert for their end of the year picnic. Their choices are ice cream sundaes (I), chocolate cake (C), and sugar cookies (S). The preference table follows.

<b>Number of Votes</b>	<b>20</b>	<b>12</b>	<b>16</b>	<b>28</b>
<b>First</b>	I	C	I	S
<b>Second</b>	S	I	C	C
<b>Third</b>	C	S	S	I

1. How many students voted?
2. Does any choice have a majority of votes?
3. Determine the winner using the plurality method.
4. Determine the winner using the Borda count method.
5. Determine the winner using the plurality method with elimination method.
6. Determine the winner using the pairwise comparison method.
7. The third graders also must pick the entertainment for their end of the year picnic. The choices are a magician (M), a clown (C), a puppet show (P), or a ventriloquist (V). The results of the election are given in the following preference table.

<b>Number of Votes</b>	<b>20</b>	<b>15</b>	<b>12</b>	<b>19</b>	<b>10</b>
<b>First</b>	M	C	P	V	M
<b>Second</b>	P	M	V	P	P
<b>Third</b>	C	V	C	M	C
<b>Fourth</b>	V	P	M	C	V

- a. Which entertainer wins this election if the plurality method is used?
- b. Which entertainer wins this election if the Borda count method is used?
- c. Which entertainer wins this election if the plurality with elimination method is used?
- d. Which entertainer wins this election if the pairwise comparison method is used?

In Exercises 1-6, the employees at a local law firm are voting on the entrée for their annual holiday party. Their choices are chicken (C), salmon (S), and steak (T). The preference table follows.

<b>Number of Votes</b>	<b>30</b>	<b>18</b>	<b>12</b>	<b>23</b>
<b>First</b>	T	C	T	S
<b>Second</b>	S	T	C	C
<b>Third</b>	C	S	S	T

1. How many employees voted?
2. Does any choice have a majority of votes?
3. Determine the winner using the plurality method.
4. Determine the winner using the Borda count method.
5. Determine the winner using the plurality method with elimination method.
6. Determine the winner using the pairwise comparison method.
7. The employees also must pick the dessert for their holiday party. The choices are cheese cake (C), apple tart (A), chocolate mousse cake (M), or vanilla ice cream (V). The results of the election are given in the following preference table.

<b>Number of Votes</b>	<b>19</b>	<b>16</b>	<b>12</b>	<b>22</b>	<b>14</b>
<b>First</b>	A	C	M	V	A
<b>Second</b>	M	A	V	M	M
<b>Third</b>	C	V	A	C	C
<b>Fourth</b>	V	M	C	A	V

- a. Which dessert wins this election if the plurality method is used?
- b. Which dessert wins this election if the Borda count method is used?
- c. Which dessert wins this election if the plurality with elimination method is used?
- d. Which dessert wins this election if the pairwise comparison method is used?