

Instructions: Show all work. Use exact answers unless otherwise directed to round.

1. Use the following preference schedule to determine the winner of the election according to the indicated method.

	25	16	4	20	5	30
1st	H	S	M	S	M	N
2nd	S	H	N	N	H	S
3rd	M	M	S	M	S	M
4th	N	N	H	N	N	H

S wins

- a. By Plurality with Elimination.

Round 1  
 H: 25  
 S: 36  
 M: 9 loser  
 N: 30

Round 2  
 H: 30 loser  
 S: 36  
 N: 34

Round 3  
 S:  $25 + 16 + 20 + 5 = 66$   
 N:  $4 + 30 = 34$

- b. By Method of Pairwise Comparisons.

1st  
 H vs S:  $25 + 5$   
 H vs M:  $25 + 16$   
 H vs N:  $25 + 16 + 5$   
 S vs M:  $25 + 16 + 20 + 30$   
 S vs N:  $25 + 16 + 20 + 5$   
 M vs N:  $25 + 16 + 4 + 5$

2nd  
 $16 + 4 + 20 + 30$   
 $4 + 20 + 5 + 30$   
 $4 + 20 + 30$   
 $4 + 5$   
 $4 + 30$   
 $20 + 30$  tied

Winner  

H	S	M	N
		$\frac{1}{2}$	$\frac{1}{2}$

S wins

2. A college have 6 branch locations with student populations (by credit hours) shown in the table. The college needs to distribute 35 math teachers across the branches. Use Hamilton's method to find a fair apportionment.

Campus	Population	Standard Quota	Lower Quota	Upper Quota	Initial Apportionment	Extra Seat?	Final Apportionment
Clearcourt	28,497	8.33	8	9	8		8
Ironston	15,482	4.53	4	5	4	1	5
Mallowpond	25,111	7.34	7	8	7		7
Brighthurst	22,172	6.48	6	7	6		6
Glassmont	12,141	3.55	3	4	3	1	4
Shoremill	16,338	4.78	4	5	4	1	5
Standard Divisor =	3421		32		32		35

Total population: 119,741

$$\frac{119741}{35} = 3421.17$$