**Scheduling Math Classes**

Every year students register for math courses. Below are the number of students that signed up for courses this year. Your job is the figure out how many of class we should teach using the Hamilton, Jefferson, Webster and Hill methods. We have 13 teachers and they teach 6 classes a year. Then determine the number of classes and class size under each apportionment method.

DON’T FORGET TO INCLUDE THE DIVISOR YOU USED

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Course | Number of Students | Quota | Apportionment | | | |
| Jefferson  D= \_\_\_\_\_ | Hamilton  D = \_\_\_\_\_\_ | Webster  D = \_\_\_\_\_\_ | Hill  D = \_\_\_\_\_ |
| Math 1 | 41 |  |  |  |  |  |
| Math 2 | 492 |  |  |  |  |  |
| Math 3 | 451 |  |  |  |  |  |
| AFM: | 237 |  |  |  |  |  |
| Pre-Calc | 173 |  |  |  |  |  |
| Level 5’s | 253 |  |  |  |  |  |
| Intro to HS | 50 |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Course | Number of Students | Class Size | | | | |
| Jefferson | Hamilton | Webster | Hill |
| Math 1 | 412 |  |  |  |  |
| Math 2 | 492 |  |  |  |  |
| Math 3 | 451 |  |  |  |  |
| AFM | 237 |  |  |  |  |
| Pre-Calc | 173 |  |  |  |  |
| Level 5 | 253 |  |  |  |  |
| Intro to HS | 50 |  |  |  |  |

b. Which method provides the "best" and “worst” distribution of the math classes? You should take into account class size and # of classes. Justify your answer.

c. If these are the numbers that signed up, why do you think ICM class has over 39 kids?

**Estate Division:**

Bryn, Harper and Shae are heirs to their parents' estate in New York. The lawyer has informed them that the estate consists of a house, a collectors' motorcycle, a Rolls Royce, a Denver Broncos' season ticket, and **$7,000 in cash**. They are told to submit the bids by mail within 7 days. The lawyer has listed their submitted bids as shown below. Use the method of fair division to divide the estate among the heirs.

**I)** For each heir, state their fair share, the items received, the amount of cash and the final settlement.

Summarize your results in a matrix.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **House** | **Motorcycle** | **Rolls Royce** | **Ticket** |
| Bryn | $40,000 | $5,000 | $35,000 | $150 |
| Harper | $38,000 | $5,500 | $27,000 | $225 |
| Shae | $42,000 | $4,300 | $26,500 | $300 |
|  |  |  |  |  |

**II)** Suppose Bryn submitted the highest bid for all the items. How would you resolve this?

**III)** Suppose Harper was out of town and didn't get her bid submitted on time, how would you resolve this? Be specific and you cannot just say wait longer for her bids.

**THE LOST SOULS OF THE MATH DEPARTMENT**

HHS has a problem and I am asking you to help me solve it. The math department is moving into the 2600 wing. In this move each teacher is going to get a new classroom. Each classroom varies in its desirability due to size, temperature, windows, proximity to bathrooms, student center and math office, etc. Ms. Mwanda’s job is to *devise a method* of assigning classrooms to each teacher. **This method must be viewed as fair by all teachers involved and they must feel that they have had a role in the outcome**.

As a class, we have just completed investigations into estate division. I felt this work could help us in this process. In using this method, though, the questions arise; a) how does one place value on a classroom and b) what do we do if a teacher is to pay the difference of her fair share into the estate (obviously a teacher is not expected to pay money in order to teach in a classroom). If the method of estate division does not seem plausible in this situation (although I feel, with some manipulation it could) come up with a method of your own. This method, though, must have the same characteristics of Estate Division. For example, in Estate Division, if one sibling did not get an article of the estate they wanted, they were compensated with money. How do we compensate when a teacher does not get the room they wanted? (Other valuables in a math department are free hours, choice of courses to teach next year, classroom materials like cabinets tables etc., as well as office space.)

For this part of the assignment you must **turn in a complete description of your method**. Be sure to try to think about all possible outcomes and you may want to come up with examples of things that may happen. Remember that teachers can also share rooms. However, if a teacher is in more than one room they need to be able to get to their other classroom easily (we have a lot of stuff).

Remember to be very specific in your description and think about all the possible outcomes. There are 14 teachers in the math department, and they all want a good room. How can we solve this problem?

Good Luck

Items to turn in for this section of the project:

* List or table of which teachers in which classrooms (please assign by period if there is more than one teacher in a room)
* Description of how you figured out this set up. Be as specific as you can.
* List of which teachers are not getting what they want and how you will still make them happy.
* List of any administrators you spoke to and what they said was ok to offer.

