

Documentation of USAMO 2010 Selection Process

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The official participation totals on the 2010 ACM contests were:

| | AMC 10 | AMC 12 | Total |
|--------|---------|---------|---------|
| A-date | 62,254 | 67,155 | 129,409 |
| B-date | 38,091 | 40,750 | 78,841 |
| Total | 100,345 | 107,905 | 208,250 |

The qualification scores on the 2010 AMC 12 A and the 2010 AMC 12 B were both 88.5 points. The qualification scores on the 2010 AMC 10 A and 2010 AMC 10 B were both 118.5.

The numbers of AIME qualifiers were

| | AMC 10 | AMC 12 | Total |
|--------|--------|--------|-------|
| A-date | 962 | 4884 | |
| B-date | 763 | 3216 | |
| Total | 1725 | 8100 | 9825 |

Of course, there is some double-counting among students who qualified on both the A-date and the B-date. Additionally, this set of scores counts the students from Taiwan who qualified for the AIME.

For purposes of USMAO selections, we started with a list of 8,223 students. This list includes some internationals, but not 1,602 AIME qualifiers mostly internationals. The majority of these omitted internationals are from Taiwan, since their records are not entered or maintained in the same way as the other scores. Those students from Taiwan may take the AIME but won't qualify for the USAMO, so there is no point in including anyway them at this point.

So we can assume that we start from 8,223 AIME qualifiers, including some from outside the USA and Canada. This number still involves some double-counting. The qualifier count matrix is now:

| | AMC 10 | AMC 12 | Total |
|--------|--------|--------|-------|
| A-date | 613 | 3466 | 4079 |
| B-date | 799 | 3345 | 4144 |
| Total | 1412 | 6811 | 8223 |

Note that the entries the B-date row are larger than the entries in the corresponding row in the selection group above. This is probably due to late scoring, or late additions after the AIME qualification criteria were set.

Next eliminate anyone with a code of F in the State column. This brings us down to 5842 total students. The matrix of USA and Canada qualifiers is:

| | AMC 10 | AMC 12 | Total |
|--------|--------|--------|-------|
| A-date | 505 | 2983 | 3488 |
| B-date | 299 | 2055 | 2354 |
| Total | 804 | 5038 | 5842 |

There were 712 non-foreign double-takers:

| | AMC 10 | AMC 12 | Total |
|-------------------|--------|--------|-------|
| Higher Score on A | 100 | 322 | 422 |
| Lower Score A | 35 | 225 | 285 |
| Higher Score on B | 65 | 225 | 285 |
| Lower Score on B | 20 | 402 | 422 |

There are 712 double-dippers. Eliminate them and you are down to 5131 AIME qualifiers by virtue of exactly one high score.

I chose the top 248 USAMO indices, that was an index of 208.5 or higher. There was a 10-way tie at 208.0

Then I selected the highest score from the 14 states not already represented: AK,AR,ID,MS,MT,NE,NV,ND,RI,SD, VT,WV,WY, PR. There is no WY, since no AIME qualifiers in WY.

Then I chose the AMC 10 takers with an AIME score of 11 or better. Among those, there were 7 who had only one score, no duplicates, so they got in automatically. Then there were 3 more who had a 10A and 10 B combination. Among the remaining 14, 10 of them had AMC 12 scores to make an index high enough that they would have got in any way by virtue of the index as 12-takers.

Then I selected the highest AMC 10 based indices, and I eliminated all

the students already selected for the USAMO. This amounted to 24 students. Then I selected 227 top AMC 10 based indices, from a top of $250 = 150 + 10 \cdot 10$ to an AMC 10 based index of 188.5. The lowest observed AIME score was a 5 (for an index of $189 = 144 + 10 \cdot 5$).

This gives 231 JMO qualifiers.

When all was said and done, there are 26 females selected for JMO with indices ranging from 226 down to 188.5

There were 19 females selected for USAMO with indices ranging from 265.5 down to 215.0.