USA(J)MO Problem Statistics

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28 April 2023

These are summary of statistics for the USA(J)MO in recent years, based on data that I noted during the grading. Although it is close, this is not totally the same as the official numbers that may be provided by the AMC headquarters. Examples of discrepancies could be:

- Students who do not take the exam could be recorded as scoring zero, or not recorded at all.

- Similarly for students who only take one day.

- Some students take the wrong exam by accident, and their scores may be recorded for overlapping problems, as zero, or not at all.

- Some students accidentally mislabel their ID number or problem number. These errors may or may not be corrected in the numbers here.

- Sometime Evan makes mistakes.

- Many other strange edge cases.

Therefore, these figures should be seen as rough estimates for educational reference only, and not as authoritative data.

Contents

1 Statistics for 2015

§1.1 Summary of scores for USAMO 2015

N	294	1st Q	3	Max	42
μ	9.00	Median	7	Top 12	27
σ	8.02	3rd Q	13	Top 24	21

§1.2 Problem statistics for USAMO 2015

	AMO1	AMO2	AMO3	AMO4	AMO5	AMO6
0	150	232	236	53	261	275
1	25	38	8	18	4	9
2	3	1	16	37	3	1
3	0	0	2	28	1	0
4	12	0	0	9	3	0
5	4	1	6	14	4	1
6	18	0	9	50	2	1
7	82	22	17	85	16	7
Avg	2.66	0.68	0.85	4.00	0.57	0.24
QM	4.12	1.97	2.18	4.84	1.87	1.19
#5+	**104**	**23**	**32**	**149**	**22**	**9**
%5+	%35.4	%7.8	%10.9	%50.7	%7.5	%3.1

§1.3 Summary of scores for JMO 2015

N	251	1st Q	5	Max	35
μ	11.54	Median	10	Top 12	28
σ	8.31	3rd Q	17	Top 24	25

§1.4 Problem statistics for JMO 2015

	JMO1	JMO2	JMO3	JMO4	JMO5	JMO6
0	72	171	228	62	156	137
1	8	15	22	92	34	22
2	1	4	0	26	0	40
3	3	0	0	11	0	12
4	30	2	0	1	0	5
5	5	1	0	1	13	9
6	30	9	0	22	2	11
7	102	49	1	36	46	15
Avg	4.22	1.73	0.12	2.27	1.73	1.49
QM	5.18	3.35	0.53	3.39	3.27	2.62
#5+	**137**	**59**	**1**	**59**	**61**	**35**
%5+	%54.6	%23.5	%0.4	%23.5	%24.3	%13.9

2 Statistics for 2016

§2.1 Summary of scores for USAMO 2016

N	315	1st Q	2	Max	42
μ	9.30	Median	8	Top 12	28
σ	8.26	3rd Q	15	Top 24	23

§2.2 Problem statistics for USAMO 2016

	AMO1	AMO2	AMO3	AMO4	AMO5	AMO6
0	105	204	303	202	293	147
1	4	36	4	14	15	15
2	125	2	0	0	0	4
3	0	14	0	0	0	47
4	0	1	1	1	1	14
5	8	0	0	0	1	1
6	4	0	1	8	0	9
7	69	58	6	90	5	78
Avg	2.54	1.56	0.18	2.21	0.19	2.62
QM	3.66	3.10	1.05	3.87	0.98	3.92
#5+	**81**	**58**	**7**	**98**	**6**	**88**
%5+	%25.7	%18.4	%2.2	%31.1	%1.9	%27.9

§2.3 Summary of scores for JMO 2016

N	203	1st Q	4	Max	37
μ	9.24	Median	8	Top 12	22
σ	7.08	3rd Q	14	Top 24	16

§2.4 Problem statistics for JMO 2016

	JMO1	JMO2	JMO3	JMO4	JMO5	JMO6
0	173	158	150	21	105	191
1	20	12	11	6	17	5
2	0	5	27	65	9	0
3	0	0	0	7	2	0
4	0	1	0	10	0	0
5	3	2	3	3	3	0
6	1	2	3	3	1	2
7	6	23	9	88	66	5
Avg	0.41	1.03	0.79	4.17	2.58	0.26
QM	1.45	2.53	1.91	4.95	4.10	1.26
#5+	**10**	**27**	**15**	**94**	**70**	**7**
%5+	%4.9	%13.3	%7.4	%46.3	%34.5	%3.4

3 Statistics for 2017

§3.1 Summary of scores for USAMO 2017

N	285	1st Q	8	Max	32
μ	12.98	Median	14	Top 12	25
σ	6.72	3rd Q	17	Top 24	23

§3.2 Problem statistics for USAMO 2017

	AMO1	AMO2	AMO3	AMO4	AMO5	AMO6
0	29	214	244	79	103	278
1	2	12	26	19	22	0
2	6	33	0	18	143	0
3	2	7	1	1	6	0
4	5	0	0	2	7	0
5	0	3	1	11	2	0
6	0	4	1	7	0	0
7	241	12	12	148	2	7
Avg	6.06	0.78	0.44	4.21	1.33	0.17
QM	6.47	1.89	1.55	5.27	1.78	1.10
#5+	**241**	**19**	**14**	**166**	**4**	**7**
%5+	%84.6	%6.7	%4.9	%58.2	%1.4	%2.5

§3.3 Summary of scores for JMO 2017

N	222	1st Q	7	Max	42
μ	15.85	Median	14	Top 12	35
σ	10.92	3rd Q	23	Top 24	33

§3.4 Problem statistics for JMO 2017

	JMO1	JMO2	JMO3	JMO4	JMO5	JMO6
0	44	116	152	118	144	131
1	1	3	4	2	3	24
2	4	35	2	36	19	7
3	2	0	0	2	0	0
4	3	0	0	12	2	2
5	0	5	0	7	0	7
6	0	4	3	10	0	5
7	168	59	61	35	54	46
Avg	5.42	2.41	2.04	2.11	1.92	1.95
QM	6.12	3.86	3.74	3.43	3.52	3.48
#5+	**168**	**68**	**64**	**52**	**54**	**58**
%5+	%75.7	%30.6	%28.8	%23.4	%24.3	%26.1

4 Statistics for 2018

§4.1 Summary of scores for USAMO 2018

N	233	1st Q	7	Max	37
μ	11.65	Median	14	Top 12	24
σ	7.57	3rd Q	16	Top 24	22

§4.2 Problem statistics for USAMO 2018

	AMO1	AMO2	AMO3	AMO4	AMO5	AMO6
0	74	172	218	52	139	201
1	5	23	7	15	60	25
2	0	21	6	14	2	0
3	0	1	1	0	0	1
4	0	0	0	0	1	1
5	0	0	0	9	1	0
6	1	0	0	14	1	0
7	153	16	1	129	29	5
Avg	4.64	0.77	0.12	4.61	1.21	0.29
QM	5.69	1.97	0.62	5.53	2.59	1.13
#5+	154	16	1	152	31	5
%5+	%66.1	%6.9	%0.4	%65.2	%13.3	%2.1

§4.3 Summary of scores for JMO 2018

N	156	1st Q	7	Max	35
μ	14.26	Median	14	Top 12	28
σ	9.15	3rd Q	21	Top 24	26

§4.4 Problem statistics for JMO 2018

	JMO1	JMO2	JMO3	JMO4	JMO5	JMO6
0	12	92	105	128	83	152
1	1	0	1	1	7	1
2	10	0	5	1	13	0
3	0	0	0	1	0	0
4	0	0	0	1	0	0
5	17	0	1	2	16	0
6	7	1	2	18	6	0
7	109	63	42	4	31	3
Avg	5.84	2.87	2.06	1.00	2.35	0.14
QM	6.23	4.47	3.73	2.43	3.75	0.97
#5+	133	64	45	24	53	3
%5+	%85.3	%41.0	%28.8	%15.4	%34.0	%1.9

5 Statistics for 2019

§5.1 Summary of scores for USAMO 2019

N	258	1st Q	9	Max	42
μ	16.22	Median	16	Top 12	35
σ	9.42	3rd Q	21	Top 24	28

§5.2 Problem statistics for USAMO 2019

	AMO1	AMO2	AMO3	AMO4	AMO5	AMO6
0	32	192	233	27	109	225
1	30	1	2	5	1	2
2	19	5	9	5	58	4
3	11	1	0	2	1	3
4	0	1	0	0	4	0
5	4	2	0	11	3	0
6	21	1	2	18	4	5
7	141	55	12	190	78	19
Avg	4.78	1.62	0.45	5.87	2.79	0.71
QM	5.56	3.31	1.64	6.31	4.10	2.12
#5+	**166**	**58**	**14**	**219**	**85**	**24**
%5+	%64.3	%22.5	%5.4	%84.9	%32.9	%9.3

§5.3 Summary of scores for JMO 2019

N	221	1st Q	6	Max	42
μ	13.91	Median	12	Top 12	33
σ	10.05	3rd Q	21	Top 24	28

§5.4 Problem statistics for JMO 2019

	JMO1	JMO2	JMO3	JMO4	JMO5	JMO6
0	12	110	202	139	86	181
1	5	27	0	1	22	5
2	47	8	4	1	7	24
3	16	0	0	0	0	0
4	7	2	1	1	0	1
5	12	44	1	1	12	0
6	8	16	0	0	18	0
7	114	14	13	78	76	10
Avg	4.89	2.10	0.49	2.52	3.33	0.57
QM	5.47	3.33	1.77	4.18	4.62	1.66
#5+	**134**	**74**	**14**	**79**	**106**	**10**
%5+	%60.6	%33.5	%6.3	%35.7	%48.0	%4.5

6 Statistics for 2020

§6.1 Summary of scores for USAMO 2020

N	194	1st Q	8	Max	42
μ	16.19	Median	15	Top 12	34
σ	9.95	3rd Q	22	Top 24	29

§6.2 Problem statistics for USAMO 2020

	AMO1	AMO2	AMO3	AMO4	AMO5	AMO6
0	23	57	143	32	71	186
1	16	7	11	88	49	1
2	8	9	3	0	17	0
3	0	3	5	0	17	0
4	0	2	0	0	9	0
5	0	8	1	0	1	1
6	4	35	1	1	9	2
7	143	73	30	73	21	4
Avg	5.45	4.14	1.30	3.12	1.94	0.24
QM	6.09	5.15	2.87	4.37	3.04	1.23
#5+	**147**	**116**	**32**	**74**	**31**	**7**
%5+	%75.8	%59.8	%16.5	%38.1	%16.0	%3.6

§6.3 Summary of scores for JMO 2020

N	149	1st Q	11	Max	42
μ	17.76	Median	17	Top 12	33
σ	9.40	3rd Q	23	Top 24	28

§6.4 Problem statistics for JMO 2020

	JMO1	JMO2	JMO3	JMO4	JMO5	JMO6
0	10	58	89	28	58	116
1	10	2	15	11	70	23
2	9	13	6	0	0	2
3	2	5	2	0	0	0
4	13	0	0	0	0	0
5	5	13	2	0	0	0
6	26	1	17	0	2	2
7	74	57	18	110	19	6
Avg	5.27	3.44	1.82	5.24	1.44	0.54
QM	5.77	4.67	3.28	6.02	2.68	1.63
#5+	**105**	**71**	**37**	**110**	**21**	**8**
%5+	%70.5	%47.7	%24.8	%73.8	%14.1	%5.4

7 Statistics for 2021

§7.1 Summary of scores for USAMO 2021

N	257	1st Q	6	Max	42
μ	14.79	Median	14	Top 12	35
σ	10.92	3rd Q	23	Top 24	29

§7.2 Problem statistics for USAMO 2021

	AMO1	AMO2	AMO3	AMO4	AMO5	AMO6
0	108	137	136	68	121	229
1	11	1	105	13	2	5
2	0	18	4	37	27	1
3	1	13	1	1	2	1
4	0	3	0	0	1	1
5	0	1	0	5	0	1
6	0	9	4	14	10	2
7	137	75	7	119	94	17
Avg	3.79	2.61	0.74	4.02	3.05	0.58
QM	5.12	4.07	1.55	5.08	4.46	1.94
#5+	**137**	**85**	**11**	**138**	**104**	**20**
%5+	%53.3	%33.1	%4.3	%53.7	%40.5	%7.8

§7.3 Summary of scores for JMO 2021

N	242	1st Q	2	Max	42
μ	11.67	Median	9	Top 12	34
σ	10.65	3rd Q	18	Top 24	28

§7.4 Problem statistics for JMO 2021

	JMO1	JMO2	JMO3	JMO4	JMO5	JMO6
0	92	166	183	99	135	197
1	26	8	26	34	12	2
2	9	0	6	7	31	21
3	5	0	1	8	2	4
4	0	0	0	5	2	0
5	4	1	2	6	8	0
6	23	1	11	28	10	2
7	83	66	13	55	42	16
Avg	3.30	1.99	0.86	2.79	1.99	0.74
QM	4.59	3.69	2.17	4.10	3.40	2.01
#5+	**110**	**68**	**26**	**89**	**60**	**18**
%5+	%45.5	%28.1	%10.7	%36.8	%24.8	%7.4

8 Statistics for 2022

§8.1 Summary of scores for USAMO 2022

N	290	1st Q	2	Max	36
μ	9.69	Median	8	Top 12	29
σ	8.44	3rd Q	15	Top 24	24

§8.2 Problem statistics for USAMO 2022

	AMO1	AMO2	AMO3	AMO4	AMO5	AMO6
0	195	176	230	67	198	159
1	12	22	51	14	16	129
2	4	2	5	66	32	2
3	11	2	1	1	13	0
4	0	1	0	3	5	0
5	2	1	0	2	0	0
6	8	7	0	5	6	0
7	58	79	3	132	20	0
Avg	1.78	2.19	0.29	3.88	1.09	0.46
QM	3.38	3.81	0.88	4.92	2.30	0.69
#5+	**68**	**87**	**3**	**139**	**26**	**0**
%5+	%23.4	%30.0	%1.0	%47.9	%9.0	%0.0

§8.3 Summary of scores for JMO 2022

N	278	1st Q	6	Max	35
μ	11.71	Median	12	Top 12	27
σ	7.75	3rd Q	16	Top 24	22

§8.4 Problem statistics for JMO 2022

	JMO1	JMO2	JMO3	JMO4	JMO5	JMO6
0	68	248	253	70	127	219
1	31	9	9	21	14	54
2	27	3	1	2	79	0
3	2	8	0	1	4	0
4	0	0	0	0	0	0
5	16	0	0	2	1	0
6	31	2	0	3	4	0
7	103	8	15	179	49	5
Avg	3.88	0.38	0.42	4.71	2.00	0.32
QM	4.92	1.42	1.64	5.68	3.25	1.04
#5+	**150**	**10**	**15**	**184**	**54**	**5**
%5+	%54.0	%3.6	%5.4	%66.2	%19.4	%1.8

9 Statistics for 2023

§9.1 Summary of scores for USAMO 2023

N	230	1st Q	9	Max	42
μ	19.23	Median	20	Top 12	39
σ	11.68	3rd Q	28	Top 24	34

§9.2 Problem statistics for USAMO 2023

	AMO1	AMO2	AMO3	AMO4	AMO5	AMO6
0	43	70	109	32	76	205
1	10	64	40	31	16	0
2	0	24	12	5	9	1
3	1	8	9	4	2	0
4	1	0	9	3	6	1
5	2	7	10	6	13	0
6	2	2	17	6	10	1
7	171	55	24	143	98	22
Avg	5.37	2.47	1.94	4.92	3.80	0.72
QM	6.09	3.71	3.20	5.71	4.96	2.22
#5+	175	64	51	155	121	23
%5+	%76.1	%27.8	%22.2	%67.4	%52.6	%10.0

§9.3 Summary of scores for JMO 2023

N	265	1st Q	11	Max	42
μ	18.37	Median	19	Top 12	34
σ	9.36	3rd Q	26	Top 24	31

§9.4 Problem statistics for JMO 2023

	JMO1	JMO2	JMO3	JMO4	JMO5	JMO6
0	44	95	71	32	77	235
1	12	18	19	43	55	19
2	4	5	31	94	6	0
3	2	1	59	28	11	4
4	5	0	18	21	2	0
5	9	2	20	11	5	1
6	8	0	10	10	7	0
7	181	144	37	26	102	6
Avg	5.31	3.96	2.83	2.63	3.35	0.29
QM	5.99	5.20	3.70	3.32	4.59	1.19
#5+	198	146	67	47	114	7
%5+	%74.7	%55.1	%25.3	%17.7	%43.0	%2.6

A Medal boundaries (starting 2022)

§A.1 Explanation

Starting in 2022, the USAMO and JMO switched to a different system of awards:

- USAMO contestants may receive a gold, silver, or bronze medal, given to approximately 6%, 12%, 18% of contestants.

- About 20% of JMO contestants receive "top winner" or "winner" status.

In addition, anyone earning 14 points or more obtains an honorable mention. The table below shows the minimum score needed for each medal in this recent system.

§A.2 USAMO medals

USAMO	Gold	Silver	Bronze
USAMO 2023	37 points	30 points	24 points
USAMO 2022	25 points	18 points	11 points

§A.3 JMO recognitions

JMO	Top Winner	Winner
JMO 2023	34 points	27 points
JMO 2022	*n/a*	17 points