YorkU Putnam Training **General Information**

September 21, 2021 Skoufranis

General Information on the Putnam

The William Lowell Putnam Mathematical Competition is the pre-eminent mathematics competition for undergraduate college students in the United States and Canada. The Putnam Competition takes place annually on the first Saturday of December (this year, December 4, 2021). The competition consists of two 3-hour sessions, one from 10AM to 1PM and one from 3PM to 6PM. During each session, participants work individually on 6 challenging mathematical problems.

The Putnam began in 1938 as a competition between mathematics departments at colleges and universities. Now the competition has grown to be the leading university-level mathematics examination in the world. Although participants work independently on the problems, there is a team aspect to the competition as well. Each institution with at least three participants forms a team consisting of its top three participants. Prizes are awarded to the participants with the highest scores and to the departments of mathematics of the five institutions whose teams obtain the highest rankings.

The competition is open only to regularly enrolled undergraduates, in colleges and universities of the United States and Canada, who have not yet received a college degree. No individual may participate in the competition more than four times. Each problem is graded on a basis of 0 to 10 points. All the necessary work to justify an answer and all the necessary steps of a proof must be shown clearly to obtain full credit. Some partial credit may be given, but only when a contestant has shown significant and substantial progress toward a solution.

2019 Rankings by Score (2020 scores were unofficial due to COVID)

Score	**Rank**	**Score**	**Rank**	**Score**	**Rank**	**Score**	**Rank**	**Score**	**Rank**	**Score**	**Rank**	**Score**	**Rank**
120	1	90	19	68	41	53	84.5	38	192	24	384	10	1088.5
119	2.5	89	20	67	43.5	52	86.5	37	199	23	403	9	1235.5
117	4	87	21	66	45	51	90.5	36	206	22	436	8	1368
103	5	85	22	65	47	50	101	35	212	21	478.5	7	1483
102	6	82	23	64	49	49	114	34	218.5	20	532	6	1558
101	7.5	81	24	63	51	48	122	33	227	19	585.5	5	1606.5
100	9	80	26.5	62	53.5	47	126.5	32	236.5	18	627	4	1680.5
99	10	79	29.5	61	56.5	45	129.5	31	249.5	17	667	3	1831.5
98	11	76	31	60	61.5	44	133.5	30	276	16	698	2	2103
97	12.5	75	32	59	67	43	138	29	306.5	15	722	1	2447.5
95	14	73	33	58	73	42	143.5	28	327.5	14	758.5	0	3428
94	15.5	72	34.5	57	77	41	153	27	344.5	13	807.5		
92	17	71	37	56	79	40	168	26	360	12	879		
91	18	69	39	54	82	39	183.5	25	371.5	11	970		

Scores per Question of Top 414 Contestants

Score	**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**Total**
10	207	290	128	36	72	8	189	92	41	25	138	59	1285
9	38	19	6	5	21	7	106	20	2	8	13	0	245
8	84	10	1	2	4	2	21	4	1	3	7	0	139
7	17	0	0	0	4	0	14	0	2	2	0	0	39
6	0	4	0	0	0	1	0	0	0	0	0	0	5
5	0	0	0	0	5	0	0	0	0	0	0	0	5
4	32	0	1	0	4	0	0	4	0	15	1	0	57
3	9	0	0	0	2	1	2	1	0	11	0	0	26
2	4	4	58	2	7	2	54	1	7	10	9	93	251
1	4	5	12	4	33	8	8	2	4	9	10	7	106
0	9	42	87	109	95	80	14	135	162	52	81	32	898
NA	10	40	121	256	167	305	6	155	195	279	155	220	1909

Recommended Strategies

- Solutions to problems on the Putnam Competition require only basic undergraduate mathematics, but are more difficult. Think of the most difficult problem on a mathematics final examination, and then increase the difficulty further for the simplest Putnam problems.
- The problems will be based on all different areas of mathematics. Thus it is beneficial to be good in all areas than it is to be excellent in just one or two areas.
- The problems are doable, but requires thinking, patience, resilience, and, for later problems, ingenuity.
- The first problem in each half should be doable by all A+ students. The next couple of problems in each half will be doable, but require some thinking. Thus scores between 20 and 60 should be possible by any student that prepares for the competition.
- The most important thing when attempting a problem is to have the correct approach to the problem. There are several common approaches, techniques, and tricks that appear on the Putnam, and we will be going through these in the coming weeks.
- The second most important thing is to have perseverance in finding the correct approach to a problem. Staring at a problem and saying to yourself 'I don't know how to do this' will get you nowhere. You need to think of different ways of approaching the problem and this will be a focus of these training sessions.
- It is way better to completely solve a few of the problems then to try and make progress on all of the problems! Thus, if there is a problem you think you can solve, spend the time, solve it fully, and write a clear solution.
- It is better to measure success by the number of problems you can solve, not by the number you cannot!

Training Sessions

The YorkU training sessions for the 2021 Putnam Competition will be held online every Tuesday from 2:30-4:00, starting September 21st. Please contact me in order to obtain the Zoom link.

Each training session will centre around a specific mathematical theme. We will begin with discussing necessary concepts, techniques, and strategies, and a set of related problems will be given. Students will have some time to solve the problems during the session and will try to solve the remaining problems at home. The session will end with students presenting solutions to the problems from either the current or previous session.

Website: http://pskoufra.info.yorku.ca/putnam/