

Stanford 2007 Putnam Hint Sheet

Get a good night's rest before taking the Putnam! Don't eat too much, as an overfull stomach can make you sleepy. Drink lots of water, stretch, breathe deeply - all of things can improve your thinking abilities. Items you may want to bring with you: comfortable clothes (dress in layers), wristwatch, pens, pencils, erasers, earplugs, seat cushion, tissues, cough drops, quiet snacks, and a sense of humor. Get comfortable, have your tools ready - and when the problem set is handed to you - get in the zone!

Take a bathroom break sometime, as a few minutes of walking will help your circulation.

Consider taking a short break for snacks and water - that can be beneficial.

Quickly read all of the problems and choose the ones you will work on first.

Look for key words or concepts that may suggest ways to solve the problem.

Remember that there are many ways to solve problems - and you just need one.

Sketch out problems to give you new perspectives. Draw pictures - they can help!

Look for ways to make substitutions to simplify the problem or make it solvable.

Explore formulas by trying values, like zero, one or two... as this may lead to insights.

Transform the existing problem into a different one, one that you can solve.

When a problem involves placing things into many bins, consider the pigeonhole principle.

Chunk the problem into several smaller, easier problems - then solve those.

When a problem involves a geometric solid - consider changing coordinate systems.

When a problem uses polynomials - consider simplification by factorization.

Maximums or minimums - think about differentiating once or even twice. Look for high/low values.

If a problem seems to suggest a mathematical theorem or proof (e.g. Mean Value Theorem) then write it down - it may help solve the problem, and get you some points.

If a problem asks to prove something for all "n", consider an induction proof.

Sometimes you can show that an opposite is impossible, therefore the solution is trivial.

Look for a way to go at the problem - insights are very useful in designing strategies to solve it.

Eliminate complicated parts of a problem through simplification and substitution.

Change the problem into one that you can solve.

Explain your reasoning whenever possible, as doing so may give you more ideas.

Always write the problem number that you are working on your answer sheets.

Try working the problem backwards.

Does your answer work? How did you get it? Write out your reasoning and explain what you did.

Use logic to construct a solution and write out your explanation.

Given triangles or other polygons - consider using trigonometry and geometry to attack the problem.

Use analogies to construct similar problems, but differently - one of your new models may be useful.

Sums, integrals and products may be interchangeable - consider rewriting the problem.

Many problems use base ten - perhaps changing to another base could help.

Trigonometry is powerful - use it to change the problem around to get new perspectives.

Exponents and polynomials may lend themselves to logarithms and manipulation - experiment!

If a problem is tough - try a completely off-the-wall technique to see if you can make progress.

Algebra is your friend! It can help you rearrange and solve tricky problems.

If a problem asks you to find something or prove something - consider that it may not be possible!

When a problem asks you to find roots - look for ways to separate the problems into smaller ones.

Take a deep breath once in awhile to clear your mind and restore your concentration. Enjoy!

Some problems have symmetries and patterns that are not obvious - play around with the problem to see if you can get a new perspective that can help find a solution.

Read the problem, and suppose the contrary - that may be what you want to prove.

Many problems have a trick or two to be solved, then the answer is simple and fast - look for it!

To prove the existence of something, just prove it once, for one example.

Everyone has differently skills and strengths. Understand how your mind works, and what problems you are best suited to solve. Use your particular talents to solve the problems that suit you. Good luck, have fun and remember - a positive mental attitude will help you do your best!

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