

Intractability

The **hard deadline** for this quiz is **Mon 3 Jun 2013 8:59 PM PDT (UTC -0700)**.

To specify an array or sequence of values in an answer, you must separate the values by a single space character (with no punctuation and with no leading or trailing whitespace). For example, if the question asks for the first ten powers of two (starting at 1), the only accepted answer is:

1 2 4 8 16 32 64 128 256 512

If you wish to discuss a particular question and answer in the forums, please post the entire question and answer, including the seed (which is used by the course staff to uniquely identify the question) and the explanation (which contains the correct answer).

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Question 1

(seed = 300363)

Which of the following would imply that $P \neq NP$? Check all that apply.

- ☐ Proving that there exists a polynomial-time algorithm for ILP (integer linear programming).
- ☐ Proving that some problem in NP has as an exponential lower bound.
- ☐ Proving that there exists a polynomial-time algorithm for LP (linear programming)
- ☐ Proving that there exists a polynomial-time algorithm for SAT (satisfiability).
- ☐ Proving that there exists a polynomial-time algorithm for FACTOR (factoring an integer).

Question 2

(seed = 563993)

Suppose that problem X is in NP, Y is NP-complete, and $P \neq NP$. Which of the following can you infer? Check all that apply.

- ☐ Y polynomial-time reduces to X.
- ☐ X polynomial-time reduces to Y.
- ☐ If Y polynomial-time reduces to X, then X is NP-complete.
- ☐ X is not NP-complete.
- ☐ X is not in P.

Question 3

(seed = 862760)

What is the definition of the complexity class NP?

- ☐ All search problems solvable in polynomial time.
- ☐ All problems not solvable in polynomial space.
- ☐ All search problems that are not solvable in polynomial time.
- ☐ All problems solvable in exponential time.
- ☐ All search problems.

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You cannot submit your work until you agree to the Honor Code. Thanks!