

CS6160 – Theory of Computation

Midterm Examination – Fall 2013 University of Virginia

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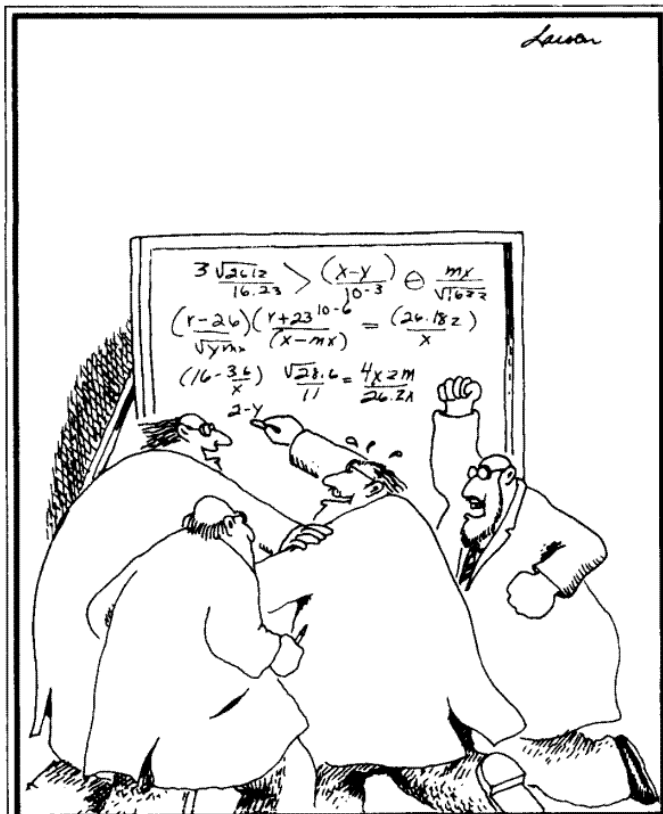
- This is a take-home open-book open notes pledged exam.
- Note: while for your convenience the “possession time” of this exam is extended up to 24 hours, the actual “work time” for this exam is up to six contiguous hours.
- No collaborations, Web searches, nor communications with others are allowed during the exam.
- Do as many of the problems as you can; please explain/prove all answers.
- Shorter proofs / explanations are much preferable to longer ones (Occam's razor!).
- Clearly state the short answer / proof idea first, and then your complete proof / explanation.
- Submit only the pages provided (use more sheets only if absolutely necessary).
- Derive answers on scratch paper first, then copy them neatly onto these pages.

During the exam, please feel free to ask clarifying questions using Email; responses will be posted to the class Web page (so please look at the class Web page often during this exam).

When you are done with this exam, please return it to me (you may slip your completed exam under my office door at 406 Rice Hall).

Good Luck!

Name: _____



“Go for it, Sidney! You’ve got it! You’ve got it! Good hands! Don’t choke!”

Problem 1:	20	_____
Problem 2:	20	_____
Problem 3:	20	_____
Problem 4:	20	_____
Problem 5:	20	_____
Problem 6:	20	_____
Problem 7:	20	_____
Problem 8:	20	_____
Total:	160	_____

1) Solve problem 2 on problem set 2.

Short answer (circle one): **True** **False**

Proof:

2) Solve problem 16 on problem set 2.

Short answer (circle one): a. True False

Proof:

Short answer (circle one): b. True False

Proof:

3) Solve problem 3.19 on page 162 in the [Sipser, Second Edition] textbook.

Proof idea:

Proof:

4) Solve problem 5.16 on page 212 in the [Sipser, Second Edition] textbook.

Proof idea:

Proof:

5) Solve problem 18 on problem set 2.

Short answer (circle one): a. True False

Proof:

Short answer (circle one): b. True False

Proof:

Short answer (circle one): c. True False

Proof:

6) Solve problem 6.23 on page 243 in the [Sipser, Second Edition] textbook.

Proof idea:

Proof:

7) Solve problem 54 on problem set 2.

Proof idea:

Proof:

8) Solve problem 60 on problem set 2.

Proof idea:

Proof:

*"Once you eliminate the impossible, whatever remains,
no matter how improbable, must be the truth."
- Sherlock Holmes (by Sir Arthur Conan Doyle, 1859-1930)*