Exam 41-2

1. **[2 marks]** Here is question 1.

Exam 41-3

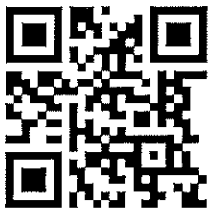
2. **[2 marks]** Here is question 2.

3. **[3 marks]** Here is question 3.

Exam 41-4

4. [**4 marks**] Here is a multi-page question.

Question 4 continued...



Exam 41-6

Use this page for rough work. If you want work on this page to be marked, please indicate this clearly *at the location of the original question.*

Exam 41-7

Use this page for rough work. If you want work on this page to be marked, please indicate this clearly *at the location of the original question.*

Exam 41-8

Name:

Question	Grade	Out of
Q1		2
Q2		2
Q3		3
Q4		4
Total		11

UNIVERSITY OF TORONTO
Faculty of Arts and Science

Midterm 1
CSC165H1S

Exam 41-1

Duration: 50 minutes
Instructor(s): David Liu, Toniann Pitassi

No Aids Allowed

Name:

Student Number:

Please read the following guidelines carefully!

- **Please write your name on both the front and back of this exam.**
- This examination has 4 questions. There are a total of **8 pages, DOUBLE-SIDED**.
- Answer questions clearly and completely, with justifications unless explicitly asked not to.
- Unless stated otherwise, your formulas can use *only* the propositional connectives and quantifiers we have seen in class, arithmetic operators (like $+$, $\times$, and exponentiation), comparison operators (like $=$ and $>$), and the divisibility and *Prime* predicates. You may not define your own sets or predicates unless asked to do so.
- All formulas must have negations applied directly to propositional variables or predicates (e.g., $\neg Prime(n)$). You do *not* need to show your work for computing negations.
- In your proofs, you may always use definitions of predicates. You may *not* use any external facts about rates of growth, divisibility, primes, or greatest common divisor unless you prove them, or they are given to you in the question.
- You may **not** use induction for your proofs on this midterm.

Take a deep breath.

This is your chance to show us
How much you've learned.
We **WANT** to give you the credit
That you've earned.
A number does not define you.

Good luck!