

UNIVERSITY OF TORONTO
Faculty of Arts and Science

Midterm 1
CSC165H1S



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

midterm1 1-1

No Aids Allowed

Name: A

Student Number: 1000000

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., $\neg\text{Prime}(n)$). 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!

midterm1 Scanned example.pdf



1. [2 marks] Here is question 1.

HAAA



2. [2 marks] Here is question 2.



3. [3 marks] Here is question 3.

$$x+y+z=8$$

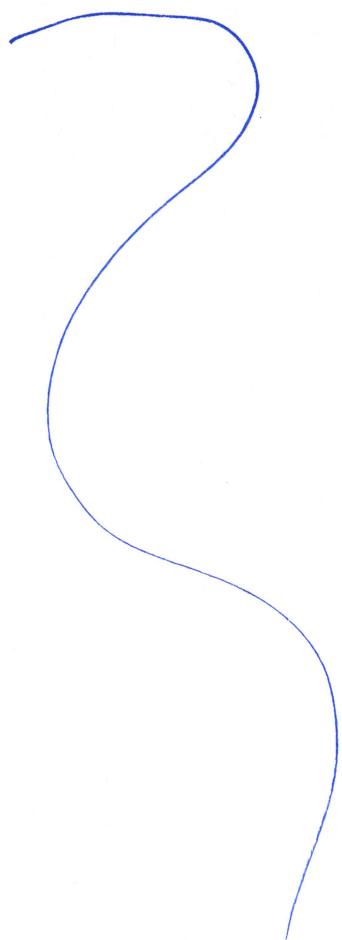
$$\therefore x=3$$

$$\therefore y=3$$

$$z=2$$

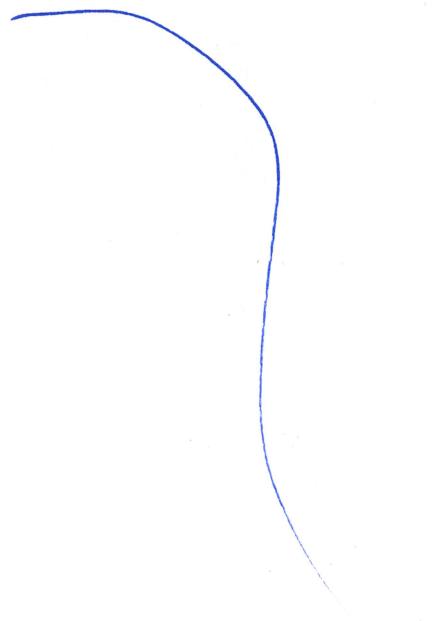


4. [4 marks] Here is a multi-page question.





Question 4 continued...



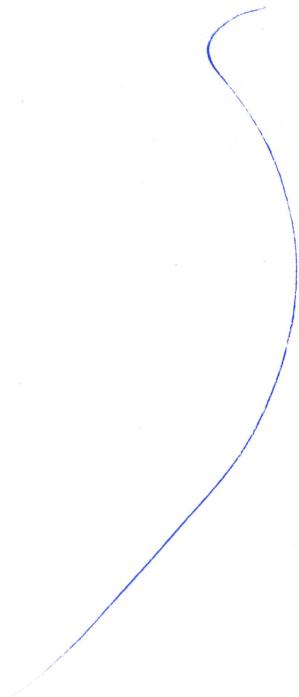


Use this page for rough work. If you want work on this page to be marked, please indicate this clearly *at the location of the original question.*





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.*





Name: A

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



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

midterm1 2-1

No Aids Allowed

Name: **B**

Student Number: **100**

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., $\neg\text{Prime}(n)$). 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!



1. [2 marks] Here is question 1.

2



2. [2 marks] Here is question 2.

3

3. [3 marks] Here is question 3.

4



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

5



Question 4 continued...

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.*

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.*

8



midterm 108165H1S , Winter 2017

Midterm 1

Name:

9

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



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

midterm1 3-1

No Aids Allowed

Name: C

Student Number: 200

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., $\neg \text{Prime}(n)$). 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!



1. [2 marks] Here is question 1.

10



2. [2 marks] Here is question 2.

|

3. [3 marks] Here is question 3.

2



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

3



Question 4 continued...

4



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.*

5



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.*

6



Name:

7

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



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

midterm1 4-1

No Aids Allowed

Name: C

Student Number: 300

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., $\neg\text{Prime}(n)$). 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!



1. [2 marks] Here is question 1.

5



2. [2 marks] Here is question 2.

b

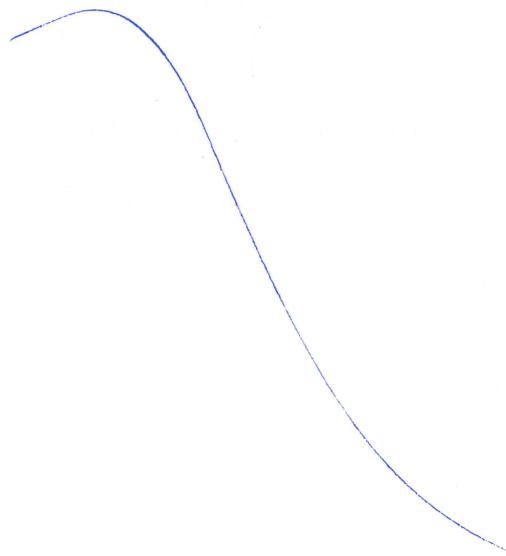
f

3. [3 marks] Here is question 3.

g



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





Question 4 continued...

9



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.*

| 0



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.*

||



Name: C

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

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

midterm1 5-1

No Aids Allowed

Name: D

Student Number: 300

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., $\neg \text{Prime}(n)$). 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!



1. [2 marks] Here is question 1.

A



2. [2 marks] Here is question 2.

B

3. [3 marks] Here is question 3.

C



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

D



Question 4 continued...

E



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.*

F



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.*

G



Name:

H

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