

## Welcome back to MAT137- Section L5101

- Open today's slides alongside Zoom
- Mute your mic and camera to avoid lag
- Your TAs today is Stephen Zhang.
- Course website: <http://uoft.me/MAT137>
  
- **Before next class:**
  - **Watch videos 1.10, 1.11, 1.12, 1.13**
  - Download next class slides.  
No need to look at them.

Let's get started!!

Today's videos: 1.7, 1.8

Today's topic: Conditionals, negations

Any question from previous class?

## Conditionals - True or False?

Let  $x \in \mathbb{R}$ .

$$1. \quad x > 0 \quad \implies \quad x \geq 0$$

$$2. \quad x \geq 0 \quad \implies \quad x > 0$$

## Conditionals - True or False?

Let  $x \in \mathbb{R}$ .

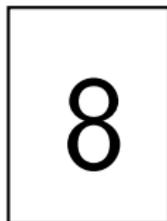
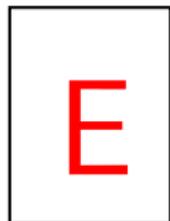
$$1. \quad x > 0 \quad \implies \quad x \geq 0$$

$$2. \quad x \geq 0 \quad \implies \quad x > 0$$

3. IF  $2 > 3$  THEN Sourav is a billionaire.

## Cards

Take a look at the following cards.



Each card has a letter on one side and a number on the other, and I tell you:

***“If a card has a vowel on one side, then it has an odd number on the other side.”***

Which cards do you need to turn over in order to verify whether I am telling the truth or not?

## Hockey

Which of the following statements are equivalent to the statement “*Every Canadian man likes hockey*”?

1. If a man is Canadian, then he likes hockey.
2. If a man likes hockey, then he is Canadian.
3. If a man does not like hockey, then he is not Canadian.
4. If a man is not Canadian, then he likes hockey.
5. Non-Canadian men do not like hockey.
6. If a Canadian does not like hockey, then she is not a man.

## What is negation?

The negation of a statement is a statement which is false whenever the original statement is true and true whenever the original is false.

What is the negation of the statement “every student in this classroom likes Mathematics”?

## Negation 1

Write the negation of these statements as simply as possible:

1. My favourite integer number is greater than 7.
2. I know at least five students at U of T who have a cellphone.
3. There is a country in the European Union with fewer than 1000 inhabitants.
4. All of my friends like apples.
5. I like apples and oranges.

## Negation of conditionals

Write the negation of these statements:

1. If Justin Trudeau has a brother, then he also has a sister.
2. If a student in this class has a brother, then they also have a sister.

## Negation 2

Write the negation of this statement without using any negative words (“no”, “not”, “none”, etc.):

*“Every page in this book contains at least one word whose first and last letters both come alphabetically before M.”*

Hint: Identify all the quantifiers. Negate each clause and move systematically.