# MATH1012 Tutorial

# Me/Facilitator: Owen

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About me:

Mathematics Honours Student.

Undergraduate at UWA with some coursework at the University of Melbourne & the National University of Singapore.

# Just in case you don't know:

1. Tutorials on Week $n+1$ are usually on Week $n$ content.

   e.g. Tutorials in Week 3, are on Week 2 content.

2. Attendance/Tutorial Participation Contributes 5% of Overall Unit Mark

# Expectations of the Class

This Class: Predominantly working on problems

Sometimes: A short summary or, a practice question.

- Please talk to me if you're confused.
- I want all of you to do well, (and feel pleased with what you have achieved).

# Recommendations (First Half of the Content):

(Personal Recommendations)

## 3Blue1Brown (Essence of Linear Algebra):

Very good at developing the intuition of the meaning of underlying topics in the course.

## Trefor Bazett (Linear Algebra):

Provides bite sized videos, the content taught in the playlist is a very close match to all the Linear Algebra content taught in MATH1012.

# This Week!

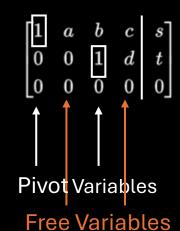## Gaussian/Gaussian-Jordan Elimination:

### Quick reminders/tips:

**REF**

$$\begin{bmatrix} a & b & c & | & s \\ 0 & d & e & | & t \\ 0 & 0 & f & | & u \end{bmatrix}$$

$$\begin{bmatrix} * & * & * & | & * \\ * & * & * & | & * \\ * & * & * & | & * \end{bmatrix}$$

$$\begin{bmatrix} * & * & * & | & * \\ 0 & * & * & | & * \\ 0 & * & * & | & * \end{bmatrix} \longrightarrow \begin{bmatrix} * & * & * & | & * \\ 0 & * & * & | & * \\ 0 & 0 & * & | & * \end{bmatrix}$$

**RREF**

$$\begin{bmatrix} 1 & 0 & 0 & | & s \\ 0 & 1 & 0 & | & t \\ 0 & 0 & 1 & | & u \end{bmatrix}$$

**Infinite Solutions:**

$$\begin{bmatrix} a & b & c & | & s \\ 0 & d & e & | & t \\ 0 & 0 & 0 & | & 0 \end{bmatrix}$$

**Pivots:**

$$\begin{bmatrix} \boxed{1} & a & b & c & | & s \\ 0 & 0 & \boxed{1} & d & | & t \\ 0 & 0 & 0 & 0 & | & 0 \end{bmatrix}$$

Pivot Variables

Free Variables

**No Solutions /Inconsistent:**

$$\begin{bmatrix} a & b & c & | & s \\ 0 & d & e & | & t \\ 0 & 0 & 0 & | & k \end{bmatrix}$$

$(k \neq 0)$

**Unique Solution:**

$$\begin{bmatrix} a & b & c & | & s \\ 0 & d & e & | & t \\ 0 & 0 & h & | & k \end{bmatrix}$$

$(h \neq 0)$

**Homogenous:**
(Zeros for constant term).

*(For Square Coefficient Matrices)

# Break – Electrical Engineering Application