Tutorial Quiz 2018

MATH1013 - Mathematics and Applications 1

Tutorial Quiz 1
Calculus and Linear Algebra

Reading time: 1 minute
Writing time: 10 minutes

Student Name: _____
University ID: _____

Question and Answer Book

Structure of Book

Number of questions	*Number of questions to be answered*	*Number of marks*
2	2	10

- Students are NOT permitted any calculators or notes during the quiz.
- Students are NOT permitted to colaborate in any form during the quiz. Any signs of collaboration or cheating will result in a nullified score and the course convenor will be informed of any academic misconduct.

Materials supplied
- Question and answer booklet of 4 pages.
- Working space is provided throughout the booklet.

Instructions
- Write your **student number** in the space provided above on this page.
- All written responses must be in English.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the examination room.

Intructions

Answer **all** questions in the space provided.
In all questions where a numerical answer is required, an exact value must be given unless otherwise specified.
In questions where more than one mark is available, appropriate working **must** be shown.
Unless otherwise indicated, the diagrams in this book are **not** drawn to scale.

Linear Algebra

Question 1

Consider the system of linear equations described by

$$2x_1 + x_2 + 2x_3 = 7, \qquad x_3 = 3.$$

a. Solve the given system of equations, writing the solution in parametric form.

[2 marks]

b. Hence, or otherwise, determine the number of free-variables.

[1 mark]

c. Hence, or otherwise, determine the associated geometric picture of the solution set. That is, determine whether the solution set is a point, a line or a plane in $\mathbb{R}^3$.

[1 mark].

Turn Over.

Calculus

Question 1

a. Let $f : \mathbb{R} \to \mathbb{R}$ be the function

$$f(x) := \begin{cases} x, & x > 0, \\ -x, & x < 0, \\ 4, & x = 0. \end{cases}$$

Evaluate $\lim_{x \to 0} f(x)$.

[1 mark].

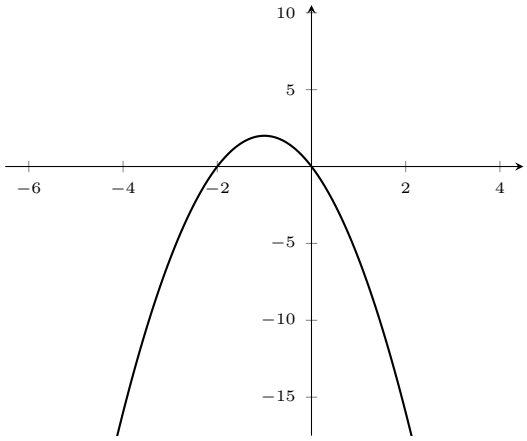
b. Determine the domain of the function

$$g(x) := \sqrt{\frac{3 - 5x}{2x + 1}}.$$

[3 marks].

Turn over

c. Consider the function $h : \mathbb{R} \to \mathbb{R}$ whose graph is given below.



On the above pair of axes, sketch the graph of $h(-x)$.

[1 mark].

END OF TUTORIAL QUIZ.