

MATHEMATICAL METHODS

2020 Trial Written Examination 1

Reading time: 15 minutes

Writing time: 1 hour

QUESTION AND ANSWER BOOK

Structure of book

<i>Number of questions</i>	<i>Number of questions to be answered</i>	<i>Number of marks</i>
9	9	40

- Students are to write in blue or black pen.
- Students are permitted to bring into the examination room: pens, pencils, highlighters, erasers, sharpeners and rulers.
- Students are NOT permitted to bring into the examination room: any technology (calculators or software), notes of any kind, blank sheets of paper and/or correction fluid/tape.

Materials supplied

- Question and answer book of 12 pages
- Formula sheet
- Working space is provided throughout the book.

Instructions

- Write your **student number** in the space provided above on this page.
- Unless otherwise indicated, the diagrams in this book are **not** drawn to scale.
- All written responses must be in English.

At the end of the examination

- You may keep the formula sheet.

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

Question 5 (7 marks)

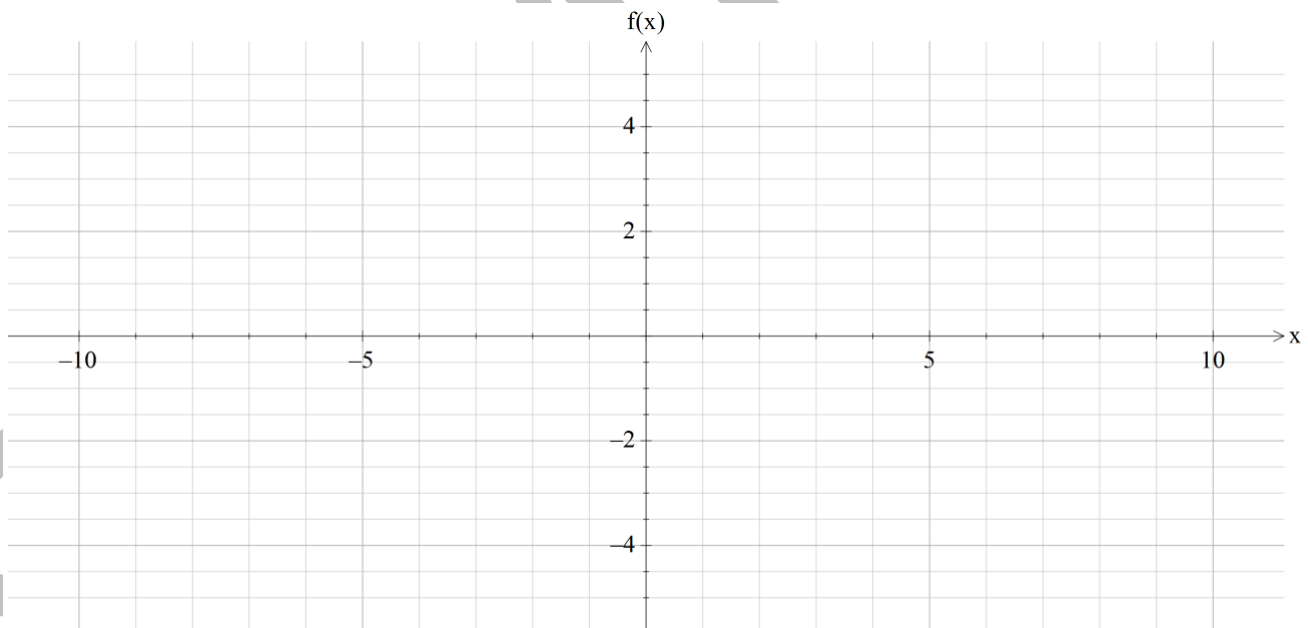
Let $f : \mathbb{R} \setminus \{1\} \rightarrow \mathbb{R}, f(x) = \frac{5-3x}{1-x}$.

a. Find the rule of $f^{-1}(x)$, stating the domain.

2 marks

b. Sketch the graph of $f^{-1}(x)$, labelling all key features.

3 marks



c. Find the area bounded by the graph of $f^{-1}(x)$, the x -axis, the line $x=5$ and $x=7$.

2 marks

Question 7 (3 marks)

A set of linear equations are given as

$$(m+1)x - 2y = k + 1$$

$$-mx + 4y = 2 - k$$

Find the values of m and k which would give infinite solutions.

3 marks
