MATH1061/7861: Last Chapter and Chapter 6 Practice Questions and Assignment 9

Last Chapter (Sections G.1) Practice Questions

The solutions to the Practice Questions are available on the website.

Section G.1 Complete the following questions from pages 26-27 of the reader, which is at the back of your workbook.

Chapter 6 (Sections 6.1–6.3) Practice Questions

The solutions to the Practice Questions are in the back of the textbook, so remember to check your solutions.

Section 6.1 Complete the following questions from pages 304–306 of the textbook. 13a, 21, 23cd, 26, 28.

Section 6.2 Complete the following questions from pages 318–320 of the textbook. 6, 8, 9, 11ab, 12ab, 14abd, 16a, 17, 19d, 21, 29ab, 32, 34a, 35a, 36a, 38.

Section 6.3 Complete the following questions from pages 330–333 of the textbook. 1a, 3, 4, 6, 9, 11, 14, 21a, 26ab, 28.

Assignment 9

Due by 5 pm Thursday 20th October, 2005. Please place youe assignment in the box marked MATH1061/7861 on level 4 of Building 67 (Maths Building). Please ensure that you attach a cover sheet to your assignment. You will find copies of the cover sheet at the back of this booklet.

Section G1: Question 1(MATH1061/7861 Special Exam, Semester 1,2003) Operation tables for $(H,+)$, $(K,\star)$ and $(H-\{a\},\times)$ are given below.

$(H,+)=$

$+$	a	b	c	d	e
a	a	b	c	d	e
b	b	e	a	c	d
c	c	a	d	e	b
d	d	c	e	b	a
e	e	d	b	a	c

$(K,\star)=$

$\star$	A	B	C	D	E
A	A	B	C	D	E
B	B	E	D	A	C
C	C	D	A	E	B
D	D	C	E	B	A
E	E	A	B	C	D

$(H-\{a\},\times)=$

$\times$	b	c	d	e
b	e	d	b	c
c	d	e	c	b
d	b	c	d	e
e	c	b	e	d

(i) Find an identity element for $(H,+)$ and an identity element for $(K,\star)$.

(ii) The system $(K,\star)$ is not a group, because associativity fails. Give an example to show that associativity in $(K,\star)$ fails.

(iii) Does $(H-\{a\},\times)$ (above) have an identity element? (If so, give it.)

(iv) In fact $(H, +, \times)$ is a field. (See the tables for $(H, +)$ and $(H - \{a\}, \times)$, above.) Find an appropriate 1–1 correspondence between the sets $\{0, 1, 2, 3, 4\}$ and $\{a, b, c, d, e\}$ to show that $(H, +, \times)$ is essentially the same as $(\mathbb{Z}_5, \oplus, \otimes)$, where $\oplus$ and $\otimes$ are addition and multiplication modulo 5.

Section 6.1, pages 304–306: Question 14abc, 32ab,

Section 6.2, pages 318–320: Questions 7abc,

Section 6.3, pages 330–333: Questions 16b, 20ab.