

Name: _____

Section: _____

Last 4 digits of student ID #: _____

This exam has ten multiple choice questions (five points each) and five free response questions (ten points each). Additional blank sheets are available if necessary for scratch work. No books or notes may be used. Turn off your cell phones and do not wear ear-plugs during the exam. You may use a calculator, but not one which has symbolic manipulation capabilities.

On the multiple choice problems:

- Select your answer by placing an X in the appropriate square of the multiple choice answer box on the front page of the exam.
- Carefully check your answers. No credit will be given for answers other than those indicated on the *multiple choice answer box*.

On the free response problems:

- Clearly indicate your answer and the reasoning used to arrive at that answer (*unsupported answers may not receive credit*),
- Give exact answers, rather than decimal approximations to the answer (unless otherwise stated).

Each free response question is followed by space to write your answer. Please write your solutions neatly in the space below the question.

Multiple Choice Answers

Question					
1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E

Exam Scores

Question	Score	Total
MC		50
11		10
12		10
13		10
14		10
15		10
Total		100

Record the correct answer to the following problems on the front page of this exam.

1. Question 2

- (A) $[-1, 1]$
- (B) $\mathbf{R} = (-\infty, \infty)$
- (C) $(-\infty, -1] \cup [1, \infty)$
- (D) $[1, \infty)$
- (E) $(-1, 1)$

2. Q

- (A) A1
- (B) A2
- (C) A3
- (D) A4
- (E) A5

Record the correct answer to the following problems on the front page of this exam.

3. Q

- (A) A1
- (B) A2
- (C) A3
- (D) A4
- (E) A5

4. Q

- (A) A1
- (B) A2
- (C) A3
- (D) A4
- (E) A5

Record the correct answer to the following problems on the front page of this exam.

5. Q

- (A) A1
- (B) A2
- (C) A3
- (D) A4
- (E) A5

6. Q

- (A) A1
- (B) A2
- (C) A3
- (D) A4
- (E) A5

Record the correct answer to the following problems on the front page of this exam.

7. Q

- (A) A1
- (B) A2
- (C) A3
- (D) A4
- (E) A5

8. Q

- (A) A1
- (B) A2
- (C) A3
- (D) A4
- (E) A5

Record the correct answer to the following problems on the front page of this exam.

9. Q

- (A) A1
- (B) A2
- (C) A3
- (D) A4
- (E) A5

10. Q

- (A) A1
- (B) A2
- (C) A3
- (D) A4
- (E) A5

Free Response Questions: Show your work!

11. Q11

(a) part a

(b) part b

Free Response Questions: Show your work!

12. Q12

Free Response Questions: Show your work!

13. Q 13

Free Response Questions: Show your work!

14. Q14

(a) part a

(b) part b

Free Response Questions: Show your work!

15. Q15

(a) part a

(b) part b