

Midterm 2

MAT1450 Sec: 17957 Fall 2017

November 09, 2017

Name:(Print)_____

ID number:_____

Do not turn the page until instructed to do so.

No books, notes, calculators, laptops, cell phones or any other help is permitted on the test.

Show all work, points will be deducted if work is sloppy or not shown. Write your arguments in a logical, well-organized and clear way.

If you need more paper use the back sides of the pages or ask for additional scratch paper. Do not forget to write your name, ID and problem number on the scratch paper and attach it to your exam.

The duration of the exam is 80 min.

You are expected to adhere to the Academic UH Honesty Policy.

Take a deep breath, and good luck!

Do not write anything on this page!

Problem	Score
1	
2	
3	
4	
5	
Total points out of 50	
Percentage	

1. (16 points) Evaluate the following definite or indefinite integrals:

(a) $\int x^2 \sin(1 - x) dx$

(b) $\int \frac{1}{1+4x^2} dx$

$$(c) \int_1^2 \frac{2}{(x-7)^4} dx$$

$$(d) \int \sqrt{1-4x^2} dx$$

2. (8 points) (a) Does the improper integral

$$\int_0^{\infty} r e^{-r^2} dr$$

converge? If so to what limit?

(b) Does the improper integral

$$\int_0^1 \frac{e^x}{x^2} dx$$

converge? If so to what limit?

Hint: Compare the integrand to a simpler function and investigate that integral.

3. (10 points) The area bounded by $x = 0$, $x = 16 - y^2$ is rotated about the line $x = -2$. Find the volume of the resulting solid by both
- (a) method of cylindrical shells

(b) method of cross-sectional area

4. (4 points) Find the length of the curve $y = x^{3/2}$ from $(0, 0)$ to $(1, 1)$.

5. (12 points) Evaluate the following integrals

(a)

$$\int \frac{3}{2x^3 - 8x} dx$$

(b)

$$\int \frac{1}{(x+1)(x^2+x+1)} dx$$