

Math 10B  
Midterm Exam 2  
February 24, 2015

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Version A

Instructions

1. Write your *Name, PID, Section, and Exam Version* on the front of your Blue Book.
2. No calculators or other electronic devices are allowed during this exam.
3. You may use one page of notes, but no books or other assistance during this exam. If you violate these instructions or communicate in any way with any other student during this exam, you will receive a zero on the exam, and the zero will not be dropped when calculating your cumulative course average.
4. Write your solutions clearly in your Blue Book:
  - (a) Carefully indicate the number and letter of each question and question part.
  - (b) Present your answers in the same order they appear in the exam.
  - (c) Start each question on a new side of a page (you can write solutions to different parts of the same question on the same side of the same page in your Blue Book).
5. Show all of your work; no credit will be given for unsupported answers.

**Special Instructions:** In order to receive full credit, please show your work when you solve integrals using u-substitution, integration by parts, partial fractions, and trigonometric substitution. You are, however, allowed to use any of the following four formulas from the table of integrals:

$$\int \sin^2 x \, dx = -\frac{1}{2} \sin x \cos x + \frac{1}{2}x + C$$

$$\int \cos^2 x \, dx = \frac{1}{2} \sin x \cos x + \frac{1}{2}x + C$$

$$\int \frac{1}{\sin x} \, dx = \frac{1}{2} \ln \left| \frac{(\cos x) - 1}{(\cos x) + 1} \right| + C$$

$$\int \frac{1}{\cos x} \, dx = \frac{1}{2} \ln \left| \frac{(\sin x) + 1}{(\sin x) - 1} \right| + C$$

Problems:

1. (4 points) Evaluate the integral  $\int \frac{9}{x^2 - 7x + 10} dx$ .

2. (8 points) Evaluate the given integral:

(a)  $\int 4t \cos(5t) dt$

(b)  $\int \frac{\sec^2(\ln x)}{x} dx$

3. (4 points) Evaluate the integral  $\int \frac{1}{x\sqrt{36 - x^2}} dx$ .

4. (4 points) Determine if the improper integral  $\int_0^3 \frac{e^x}{e^x - 1} dx$  converges or diverges. If it converges, find its value.

5. (4 points) Find the area of the region bounded by the graphs of  $y = x^2 - 4x$  and  $y = 3x$ . In case you find it useful, the region is sketched in the figure below.

