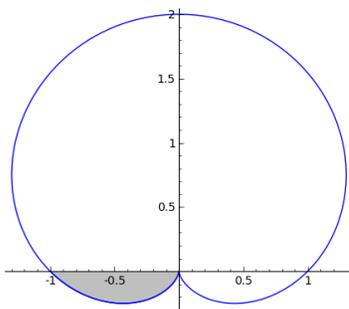


Math 20B  
Midterm Exam 1  
January 30, 2014  
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Version A

Instructions

1. No calculators or other electronic devices are allowed during this exam.
  2. You may use one page of notes, but no books or other assistance during this exam.
  3. Write your *Name*, *PID*, and *Section* on the front of your Blue Book.
  4. Write the *Version* of your exam on the front of your Blue Book.
  5. 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.
  6. Read each question carefully, and answer each question completely.
  7. Show all of your work; no credit will be given for unsupported answers.
0. (1 point) Carefully read and complete the instructions at the top of this exam sheet and any additional instructions given during the exam.
1. (6 points) The triangular region bounded by the lines  $x + y = 1$ ,  $x = 0$ , and  $y = 0$  is rotated around the line  $x = -3$ . What is the volume of the resulting solid?
2. (a) (3 points) Calculate the antiderivative  $\int 6x^2 \sin(2x^3) dx$ .
- (b) (3 points) Calculate the definite integral  $\int_0^{\pi/2} x \cos(2x) dx$ .
3. (6 points) Find the area of the shaded region enclosed by the polar curve  $r = 1 + \sin(\theta)$ , as shown in the figure below.



4. (6 points) A particle moves in a line with  $x(t)$  its position as a function of time  $t$ . Its velocity is  $v(t) = 1 - 2t$  and its position at time  $t = 0$  is  $x(0) = 0$ .
- (a) Find  $x(3)$ .
  - (b) Find the time  $\tau > 0$  at which  $x(\tau) = -20$ .