Math 2B: Integral Calculus
Midterm 2 (44300)
Nov 4th, 2016
11:00–11:50

Name:

Student Id#:

Discussion Class Time:

Total marks = 50 (per question in brackets)

No calculators or other electronic devices

Unless otherwise stated, include all your working and simplify for full credit

Try all parts of every question, even if you can't do the first part

Question	Marks
1	/20
2	/8
3	/7
4	/7
5	/8
Total	/50

1. Evaluate the following integrals: simplify your answers as much as possible

(a) $\int_{-2}^{2} y^2 - y^{1/3} \, dy$ (4)

(b) $\int \tan^3\theta \sec^7\theta \, d\theta$ (6)

(c) $\displaystyle\int \frac{x^2}{\sqrt{1-x^2}}\,dx$ (10)

2. Use the method of partial fractions to compute the integral (8)

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

3. Find the length of the curve $y = x^3 + \frac{1}{12x}$ between $x = 1$ and $x = 2$.

(7)

4. For what values of k does the integral $\int_0^\infty xe^{kx}\,dx$ converge? Evaluate the integral for such k. (7)

5. Approximate the area under the curve $y = 4 - \frac{1}{4}x^2$ between $x = 1$ and $x = 4$ using left endpoints and three subintervals. Sketch the curve and your approximating rectangles. Is your approximation an over- or underestimate of the area? (8)