

Math 113 Exam 2 PART A

RED DO NOT WRITE
TWO PART

Instructions:

- Bubble your answer to the questions on the provided scantron. Use a # 2 pencil.
- Calculators are not allowed.
- Do not write on the exam. Use your own scratch paper, or part B. Scratch paper will not be saved.
- Please do not talk about the test with other students until after the last day to take the exam.

Part A: Multiple Choice *Mark the correct answer on the bubble sheet provided.*

1. Find $\int \frac{x^3 + 4}{x^2 + 4} dx$.

- a) $x^2/2 - 2 \ln(x^2 + 4) + 2 \arctan(x/2) + C$ b) $x^2/2 - 2 \ln(x^2 + 4) - 2 \arctan(x/2) + C$
c) $-x^2/2 + 2 \ln(x^2 + 4) + 2 \arctan(x/2) + C$ d) $x^2/2 - 2 \ln(x^2 + 4) - 2 \arctan(x/2) + C$
e) $-x^2/2 - 2 \ln(x^2 + 4) - 2 \arctan(x/2) + C$

2. Find $\int \frac{1}{1 + e^x} dx$.

- a) $-x - \ln(1 + e^x) + C$ b) $x - \ln(1 - e^x) + C$ c) $x - \ln(1 + e^x) + C$
d) $x + \ln(1 + e^x) + C$ e) $-x - \ln(1 - e^x) + C$

3. Find $\int_0^{\pi/4} \tan^2(x) \sec^2(x) dx$.

- a) Is divergent b) $\frac{1}{3}$ c) $\frac{1}{2}$
d) $\frac{\pi}{3}$ e) $\sqrt{2} - 1$ f) $-\frac{\pi}{3}$

4. Find the arc length of the curve $f(t) = 5 + t^{3/2}$ for $0 \leq t \leq 1$.

- a) The arclength is infinite b) $\frac{27}{5}$ c) $\frac{17}{8}$
d) $\frac{13}{27}\sqrt{13} + \frac{8}{27}$ e) $\frac{13}{27}\sqrt{13} - \frac{18}{27}$ f) $\frac{13}{27}\sqrt{13} - \frac{8}{27}$

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5. Find the area of the surface obtained by rotating $y = \sqrt{1 + 4x}$ about the x -axis for $1 \leq x \leq 5$.
- a) $\frac{98}{2}\pi$ b) $\frac{98}{3}$ c) $\frac{98}{2}$
- d) $\frac{98}{3}\pi^2$ e) $\frac{3}{98}\pi$ f) $\frac{98}{3}\pi$
6. Find the y value of the centroid of the region bounded by $y = 0$ and $y = \cos(x)$ for $-\pi/2 \leq x \leq \pi/2$.
(The x -value will be 0.)
- a) π b) $\frac{\pi}{2}$ c) 1
- d) $\frac{\pi}{4}$ e) $\frac{\pi}{8}$ f) $\frac{1}{2}$
7. Let $f(x) = k(3x - x^2)$ for $0 \leq x \leq 3$ and $f(x) = 0$ for all other values of x . For which value of k is $f(x)$ a probability density function?
- a) 1 b) 3 c) 2/9
- d) 1/3 e) 9/2 f) None of these
8. Find $\int \frac{1-x}{\sqrt{1-x^2}} dx$
- a) $\sin^{-1} x + \sqrt{1-x^2} + C$ b) $\sin^{-1} x - \sqrt{1-x^2} + C$
- c) $-\sin^{-1} x - \sqrt{1-x^2} + C$ d) $-\sin^{-1} x + \sqrt{1-x^2} + C$
- e) $\sin^{-1} x + \sqrt{1-x} + C$ f) None of these
9. Find $\int_2^3 \frac{x^3}{x-1} dx$
- a) $\frac{59}{6} - \ln(2)$ b) $-\frac{59}{6} + \ln(2)$ c) $\frac{59}{3} + \ln(2)$
- d) $\frac{59}{3} - \ln(2)$ e) $\frac{59}{6} + \ln(2)$ f) $-\frac{59}{3} - \ln(2)$
- g) None of these

END OF PART A