

Name: _____

Student ID: _____

Section: _____

Instructor: _____

Math 113 (Calculus II)

Exam 1 Part B

Sep 25-27, late day Sep 28

TWO PART

Instructions:

- For questions which require a written answer, show all your work. Full credit will be given only if the necessary work is shown justifying your answer.
- Simplify your answers.
- Calculators are not allowed.
- Should you have need for more space than is allocated to answer a question, use the back of the page the problem is on and indicate this fact.
- Please do not talk about the test with other students until after the last day to take the exam.

#	Possible	Earned
MC	48	
13	9	
14	9	
15	9	
16	9	
17	8	
18	8	
Total	100	

Part B: *Show all work in the space provided.*

13. (9 points) Find the area enclosed by the curves $y = \ln x$ and $y = 1$ from $x = 1$ to $x = 2e$.

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14. (9 points) Find the volume of the solid obtained by rotating the region bounded by the curves $y = e^x$ and $y = x + 1$ from $x = 0$ to $x = 1$ about $y = -2$.

15. (9 points) A rope of length 5 m is hanging vertically from a crane at the top of a building 15 m tall. A mass of 3 kg is attached to the end of the rope. How much work is required to pull the rope and mass to the top of the building? (Remember, acceleration due to gravity is 9.8 m/s^2 .)

[Note: In the problem the weight density of the rope was inadvertently not stated. Students who trivialized the problem by assuming a weight density of 0 received very low scores. Students not satisfied with the way the problem was graded were given the opportunity on Exam 2 to answer a optional question this topic and replace the lower score with a higher score.]

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16. (9 points) Evaluate the integral $\int t \sin(t^2) e^{t^2} dt$ by first making a substitution and then integrating by parts.

17. (8 points) Compute the indefinite integral: $\int \cos 2x \cdot \sin x dx$
(**Hint:** You may want to use the double angle identity: $\cos 2x = 2 \cos^2 x - 1$.)

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18. (8 points) Compute the indefinite integral: $\int \sqrt{x^2 + 4} dx$

END OF EXAM