

MATH 217
Second Midterm Exam
Prof. Jesenko Vukadinović

Name: _____

TA: _____

P1 (a)	
P1 (b)	
P2 (a)	
P2 (b)	
P3	
P4	
P5	
TOTAL	

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Read each question carefully and try to understand it before answering the questions. You may use the back of the pages if you need extra space. **Show all the computations to get full credit. Write clearly. Good luck!!**

1. Let R be the region in the first quadrant, bounded by the parabola $y = 6 + x - x^2$, the x -axis and the y -axis. Sketch the region and then determine
 - (a) The volume of the solid obtained when revolving R about the x -axis.
 - (b) The volume of the solid obtained when revolving R about the y -axis.

2. Find the derivative dy/dx using logarithmic differentiation:

(a)

$$y = \frac{(1 + 2x^2)^2}{(3 + x^2)^3} \sqrt{\frac{(3 + 2x^2)^3}{1 + x^2}}$$

(b)

$$y = (x^4)^{\cos^2 x}$$

3. A bacterial population observed over a course of 10 hours increased its size by 80%. What is its doubling time, if it grows at a rate proportional to its size? What is the tripling time (the time it takes for the population to triple itself)?

4. Find the integral

$$\int \frac{5^{1/x^3}}{x^4} dx$$

5. Solve the equation

$$e^x - 1 = 6e^{-x}.$$