

MATH 217
Second Midterm Exam
Prof. Jesenko Vukadinović

Name: _____
TA: _____

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

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 $y = 2 + x - x^2$, 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)

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

(b)

$$y = (x^2)^{\sin^2 x}$$

3. A bacterial population observed over a course of 10 hours increased its size by 75%. 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

$$\int \frac{10^{1/x^2}}{x^3} dx$$

5. Solve the equation

$$e^x + 2 = 8e^{-x}.$$