

PrinceSultanUniversity

Department of Mathematical Sciences

Fall Term, 2015 October 14, 2015 MATH 113 First Major

Time Allowed: 90 minutes

Name of the stud	lent:
ID number	:

Instructor's names: Dr. Wasfi Shatanawi, Dr. Nabil Mlaiki

Important Instructions:

- 1. You may use a scientific calculator that does not have programming or graphing capabilities.
- 2. You may NOT borrow a calculator from anyone.
- 3. You may NOT use notes or any textbook.
- 4. There should be NO talking during the examination.
- 5. Your exam will be taken immediately if your mobile phone is seen or heard
- 6. Looking around or making an attempt to cheat will result in your exam being cancelled
- 7. This examination <u>has 9 problems</u>, some with several parts and a <u>total of 6</u> <u>pages</u>. Make sure your paper has all these problems.

40	20

Problem1: If $f(x) = x^3 - 3x$, $0 \le x \le 2$; evaluate the Riemann sum with n = 6. Taking simple points to be the right endpoints. What is the Riemann sum represent?

Problem 2: Use the midpoint rule with n=4, to approximate the integral $\int_0^8 \sin \sqrt{x} \ dx$.

Problem 3: Use the Fundamental Theorem of Calculus to find the derivative of the function $g(x) = \int_0^x \sqrt{t^2 + 4}$.

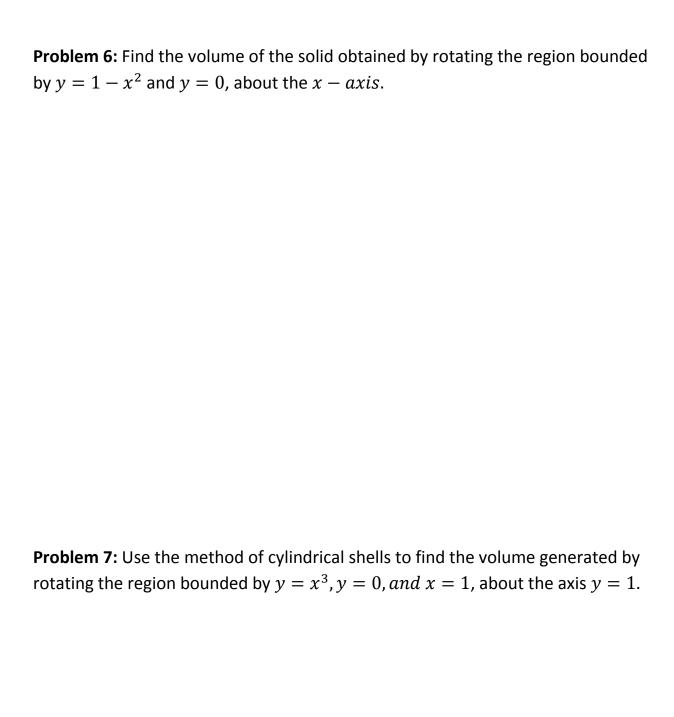
Problem 4: Evaluate the following integral

$$a) \int_{1}^{2} \frac{2+3t}{\sqrt{t}} dt$$

$$b) \int_0^{\frac{\pi}{4}} \frac{1 + \cos^2 \theta}{\cos^2 \theta} \, d\theta$$

c)
$$\int \frac{x^2}{1+x^3} dx$$

Problem 5: Find the area of the region enclosed by $y = \sqrt{x-1}$ and x-y=1.



Problem 8: Find the average value of the function $f(x) = \sin(4x)$ on the interval $[-\pi,\pi]$.

Problem 9: Evaluate

$$\int x^2 \sin 2x \ dx$$