

Name: \_\_\_\_\_

**Test 4**  
Spring 2007  
MATH 122 Section 01  
March 26, 2007

**Directions :** You have 50 minutes to complete all 4 problems on this exam. There are a possible 100 points to be earned. Please be sure to show all pertinent work. *An correct answer with no work will receive little credit!* If any portion of the exam is unclear please come to me and I will elaborate provided I can do so without giving away the problem.

1. (25 points)

Use the arc length formula to find the length of the curve  $y = 2 - 3x$ ,  $-2 \leq x \leq 1$ . Check your answer by noting that the curve is a line segment and calculating its length by the distance formula.

2. (25 points)

Find the area of the surface obtained by rotating the curve  $y = \sqrt{x}$ ,  $4 \leq x \leq 9$  about the  $x$ -axis.

3. (25 points)

Use the theorem of Pappus to find the volume of a cone with height  $h$  and base radius  $r$ .

4. (25 points)

Find a formula for the general term  $a_n$  of the sequence  $\{1, -\frac{2}{3}, \frac{4}{9}, -\frac{8}{27}, \dots\}$ , assuming that the pattern of the first few terms continues. If the sequence converges, what is the limit?