Math 252
Exam I

_____
Name

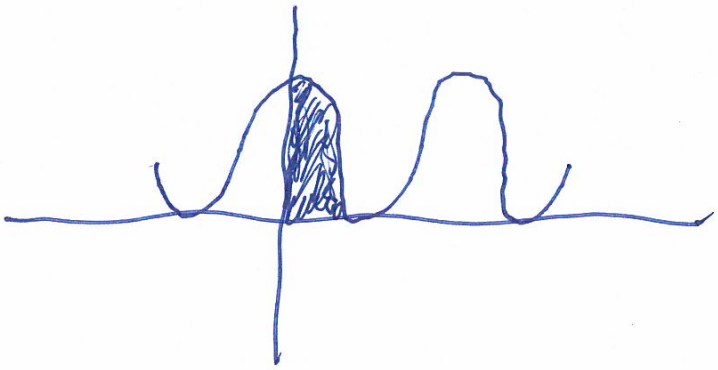
"In mathematics you don't understand things. You just get used to them."
--Johann von Neuman

THIS EXAM IS OPEN BOOK AND OPEN NOTES BUT ALL ELECTRONICS MUST BE TURNED OFF AND PUT AWAY (THIS INCLUDES CELL-PHONES AND I-PADS). BALD ANSWERS ARE NOT ALLOWED ON ANY QUESTION.

1 (10 Points). Evaluate $\int \text{Cos}(\,x\,)\,\text{Sin}(\,2x\,)\,dx$.

2 (12 Points). Evaluate $\int_0^4 \frac{dx}{\sqrt{4-x}}$

3 (14 Points). Consider the graph of y=1+Cos(x), as shown. Compute the volume of the shaded region when rotated about the x-axis.



4 (13 Points). A region in the xy-plane is bounded by the x-axis and the line $y = x^2 - 4$. A solid object sits on this region. Cross sections perpendicular to the x-axis are squares. What is the volume of this object?

5 (13 Points). A force of two pounds stretches a spring two inches. How much work is required to stretch the spring two feet? Express your answer in foot-pounds.

6 (14 Points). Evaluate $\int \frac{8x^3}{\sqrt{9-x^2}}\,dx$ using a trig-substitution.

8 (13 Points). Consider the graph of $y=7+6x^{1.5}$ on the interval $0 \leq x \leq 1$. What is the arc-length?