Practice Exam # 1

Question 1 (20 points):

Question 2 (20 points):

Question 3 (20 points):

Question 4 (20 points):

Question 5 (20 points):

TOTAL SCORE:

Notes:
1. You have 50 minutes to complete the exam.
2. For full credit you must show your work completely. Simply writing down an answer without justifying it will receive very little partial credit.
3. NO TEXTBOOKS, NOTES or CALCULATORS are allowed while you take this exam.
1. (20 points) Find the volume of the solid generated by revolving the region in the first quadrant bounded by the curve $y = x^3$, and the lines $y = 8$ and $x = 0$ about the line $x = -2$. 
2. (20 points) Find the length of the arc of the curve $y^2 = x^3$ between the points $(1, 1)$ and $(4, 8)$. 
3. (20 points) Find the area of the surface generated by revolving the curve given by \( x = \frac{e^y + e^{-y}}{2}, \ 0 \leq y \leq \ln 2 \) about the \( y \)-axis.
4. (20 points) Evaluate the indefinite integral \( \int \frac{\sec x}{\sqrt{\ln(\sec x + \tan x)}} \, dx \).
5. (a) (10 points) Show that \( \ln(\ln x) = O(\ln x) \)
(b) (10 points) Does \((x^3 + 2x + 1)^{1/3}\) grow faster than \((x^2 + 2x + 1)^{1/3}\) as \(x \to \infty\)?