CALCULUS 2
EXAM II
March 16, 1999

Show all work for full credit. No calculators, books or notes are allowed. The point value of each problem is given in the margin.

<table>
<thead>
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<th>problem</th>
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In problems 1-7, evaluate the given integrals.

(12) 1. $\int_0^{\pi/8} \cos^3 4x \, dx$
(12) 2. $\int x \sec^2 x \, dx$

(12) 3. $\int \frac{x \, dx}{\sqrt{1 - x^4}}$ (Hint: Substitution works.)

(12) 4. $\int \sec^4 x \, dx$
(15) \[ 5. \int \frac{x^3 + 1}{x^4 + x^2} \, dx \]
(12) 6. \[ \int \sqrt{9 + 4x^2} \, dx \]
(12) 7. \[ \int \frac{dx}{\sqrt{2x - x^2}} \]
(13) 8. "Raphael’s horn" is the solid figure obtained by rotating the graph of $y = e^{-x}$ around the $y$-axis, from 0 to $\infty$. Find the volume of Raphael’s horn. (For full credit, set up the “volume element” in full detail.)