

217 EXAM II, APRIL 2, 2003

NAME: _____

T.A.: _____

INSTRUCTIONS: Show all your work. Answers alone will receive little or no credit. Be neat. We do not want to be required to guess at what you're doing. We must be able to see how you got to your answer. **Take your time and be careful with your calculations. A mistake early in your work could be costly.**

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

TOTAL _____

1. (15 p'ts.) The base of a solid is bounded by $y = \sqrt{\cos x}$, $-\pi/2 \leq x \leq \pi/2$ and the x -axis. Each cross section perpendicular to the x -axis is a square sitting on this base. Find the volume of this solid.

Ans. _____

2. (15 p'ts.) A solid is generated by rotating the plane region bounded by $y = x^2$, and $y = 3x$ about the y -axis. find the volume of this solid.

Ans. _____

3. (20 p'ts.) A curve in the xy -plane is described by the parametric equations $x = 1 - t^2$, $y = 2t$, $0 \leq t \leq 1$. Find the area of the surface generated by rotating this curve about the x -axis.

Ans. _____

4. (20 p'ts.) a) Evaluate $\int_0^2 x2^{x^2} dx$.

Ans. _____

b) $f(x) = x^{\sin x}$. Find $f'(1)$.

Ans. _____

5. (15 p'ts.) The population of the United States was 3.9 million in 1790 and 178 million in 1960. If the rate of growth is assumed to be proportional to the number present, estimate the population in 2000.

Ans. _____

6. (15 p'ts.) Evaluate $\int_0^{\pi/2} \frac{\sin \theta}{1+\cos^2 \theta} d\theta$.

Ans. _____