A.P. Calculus Test Chapter 7 Name _____

No calculators are allowed on this test. Leave answers in radical form and in terms of π. Go through and set up all the free response problems. Then, and only then, go back and solve the problems.

I. Multiple Choice

_____ 1. The area of the region bounded by the lines $x = 0$, $x = 2$, and $y = 0$, and the curve $y=e^{\left(\frac{x}{2}\right)}$ is

(A) $\frac{e-1}{2}$

(B) $e-1$

(C) $2\,(e-1)$

(D) $2e-1$

(E) $2e$

_____ 2. What is the area of the region completely bounded by the curve $y = -x^2 + x + 6$ and the line $y = 4$?

(A) $\frac{3}{2}$ (B) $\frac{7}{3}$ (C) $\frac{9}{2}$ (D) $\frac{31}{6}$ (E) $\frac{33}{2}$

_____ 3. The region in the first quadrant bounded by the graph of $y = \sec(x)$, $x = \frac{\pi}{4}$, and the axes is rotated about the x-axis. What is the volume of the solid generated?

(A) $\frac{\pi^2}{4}$ (B) $\pi - 1$ (C) 2π (D) π (E) $\frac{8\pi}{3}$

II. Free Response

4. Determine the area of the region bounded by $y = x^2$ and $y = 2x$.

5. Determine the area of the region bounded by $x = 2y^2 - 5$ and $x = y^2 + 4$.

6. Determine the length of the curve $y = x^{\frac{3}{2}}$ from x = 0 to x = 4.

7. The region bounded by the x-axis, y-axis, and the portion of the curve $y = 4 - x^2$ in the first quadrant is revolved around the y-axis. Determine the volume of this solid of revolution.

8. Determine the volume of the solid obtained by revolving the region bounded by $y = x$ and $y = x^2$ about the x-axis.

9. Determine the volume of the solid obtained by revolving the region bounded by $y = \sqrt{x}$, the x-axis, and the line $x = 9$ about the y-axis.

10. Determine the volume of the solid that results when the region bounded by the curve $y = x^2$ and the line $y = 4x$ is revolved about the line $y = -2$.
Set up but do not integrate the integral.