Name: _____

4-digit code: _____

- Write your name and the last 4 digits of your SSN in the space provided above.
- The test has four (4) pages, including this one.
- Show sufficient work to justify all answers unless otherwise stated in the problem. Correct answers with inconsistent work may not be given credit.
- Credit for each problem is given at the right of each problem number.
- No books, notes or calculators may be used on this test.

Page	**Max**	**Points**
2	30	
3	35	
4	35	
Total	100	

Problem 1 (30 pts)**.** Evaluate the integrals below

(a) $\displaystyle\int_0^{\pi} \cos\theta \sin\theta \, d\theta$

(b) $\displaystyle\int_0^{\infty} \frac{\sin(\frac{\pi}{2}e^{-x})}{e^x} \, dx$

(c) $\displaystyle\int_0^{\pi^2/4} \frac{\cos\sqrt{t}}{\sqrt{t}} \, dt$

Problem 2 (10 pts)**.** Compute the area of the region bounded by the graphs of $y = \cos x$ and $y = \sin x$ between $x = 0$ and $x = 2\pi$.

Problem 3 (20 pts)**.** Find the area of the region bounded by the graphs of $y = \dfrac{1}{x}$, $y = \dfrac{1}{x^2}$ and $x = 2$.

Problem 4. Find the volume of the solid obtained by rotating the region bounded by the curve $y = \sqrt{x}$ between $x = 1$ and $x = 9$ about the x–axis.

Problem 5 (20 pts)**.** Find the volume of the solid obtained by rotating the curve $x = 4y^2 - y^3$ about the y–axis.

Hint: You need to find first the interval of integration, by computing where the given curve intersects the y–axis.