

MA 234-01
§15.1–16.3

Test #2

score

Name: _____

23 May 1997

1. Evaluate $\iint_R y \sin x \, dy \, dx$ where R is the region in the first quadrant of the xy -plane below the curve $y = \cos x$ between $x = 0$ and $x = \pi$. (16 points)
2. Find the volume of the solid in 3-space which is below the surface $z = xy$ and above the region in the xy -plane bounded by the curves $y = \sqrt{x}$ and $y = x^2$. (17 points)
3. Find the moment of inertia about the z -axis of a sphere of radius 1 centered at the origin if the mass density at any point in the ball is given by $\rho(x, y, z) = \sqrt{x^2 + y^2}$. (17 points)
4. A square in the xy -plane with vertices $(2, 2)$, $(4, 0)$, $(6, 2)$, and $(4, 4)$ is revolved about the y -axis. Find the volume of the resulting solid of revolution. (16 points)
5. Find the volume of the solid in 3-space under the surface $z = 16 - x^2 - y^2$ and above the xy -plane. (16 points)
6. Compute the arclength of the curve given by $r(t) = (3 \cos(2t), 3 \sin(2t), 4t)$ for $0 \leq t \leq 2\pi$. (16 points)