Group #4 Extra Credit

Jake Banner – Triple Spherical

1. Find the spherical limits for the integral that calculates the volume of the solid between the sphere p = cos Φ & the hemisphere p = 9, z ≥ 0. Then evaluate the integral.
2. Evaluate the spherical coordinate integral: $\iiint p^2$sinΦ dpdΦdθ. 2π ≥p≥ 0, π ≥Φ≥ 0, 4sinΦ ≥Θ≥ 0.

Nathan Howell – Triple Cylindrical

1. Evaluate the Cylindrical coordinate integral: $\iiint$ z dzrdrdθ. 3*sqrt(9-r^2) ≥z≥ -sqrt(9-r2), θ /π ≥r≥ 0, π ≥ θ ≥ 0.
2. Find the volume of the region bounded by z = 10e – ex^2 – ey^2 above and z = ex^2 + ey^2 below.

Dylan Myers – Double Polar & Conversion

1. Change the cartesian integral into an equivalent polar integral. Then evaluate the polar integral. $\iint$ $e^{\text{sqrt(x ^2+y^2)}}$. sqrt(ln3)^2-$y^2$ ≥x≥ 0, ln3 ≥y≥ 0.
2. Sketch the region of integration and convert the polar integral to a cartesian integral. Evaluate $\iint r^5\cos^2\theta$ drdθ. 4sec θ ≥ r ≥ 0, π/4 ≥ θ ≥ 0.
3. Find the area of the region cut from the first quadrant by the curve r = 2(2-sin 2θ)^2
4. Evaluate the Integral

$$\int_0^{\tan^{-1}\frac{4}{3}}\int_0^{3\sec\theta} r^7\,dr\,d\theta + \int_{\tan^{-1}\frac{4}{3}}^{\pi/2}\int_0^{4\csc\theta} r^7\,dr\,d\theta$$

Mark McMurtury – Double Type I and II.

1. Find the area of the region enclosed by 2x+2 and x^2+x.
2. Find the area of the region bound by the points (-1,0), (1,0), and (0,3).

Zachary Owens – Triple I, II & III

1. Describe the tetrahedron with vertices at (0,0,0), (1,0,0), (0,2,0) & (0,0,3) as a **TYPE III** solid.
2. Write an integral that represents the volume of the tetrahedron cut from the first octant by the plane 2x + 3y + z = 6. Use **Type II** to help solve.
3. Evaluate $\iiint_R$ 6xy dzdydx where R lies under z = 1+x+y but above the region bounded by y = sqrt(x), y = 0 and x = 1. Use **Type I** to solve.

Robert Hansen – Spherical Conversion

1. Set up triple integrals for the volume of a sphere p = 10 in
   a. Spherical Coordinates
   b. Cylindrical Coordinates
   c. Rectangular Coordinates
2. Set up the triple Integral for the cylinder 5 ≥z≥ 0, 7 ≥r≥ 0, π/2 ≥θ≥ 0 in
   a. Cylindrical Coordinates
   b. Spherical Coordinates
   c. Rectangular Coordinates

Jeffrey Eberspeaker – Cylindrical Conversion

1. Find the volume of the region enclosed by the cylinder $x^2+y^2 = 36$ and the planes $z = 0$ & $y+z = 12$
2. Find the volume of the region cut from the solid cylinder $x^2+y^2 \leq 9$ by the sphere $x^2+y^2+z^2 = 16$

Ralph DeFilio – Change of Variables in Multiple Integrals

1. Evaluate $\iint$ sqrt(x+y)*$(y-2x)^2$ dydx. $1-x \geq y \geq 0$, $1 \geq x \geq 0$
2. Evaluate $\iint_R$ $(2x^2-xy-y^2)$ dxdy. For the Region R in the first quadrant bounded by the lines $y = -2x+4$, $y = -2x+7$, $y = x-2$ and $y = x+1$.