HW 8
Math 261, F18

Please see the course syllabus for details on how to turn in your homework assignments. This one is due at the beginning of your class on **Friday, November 2**.

1. Using *cylindrical* coordinates, set up the integral to find the volume of the region enclosed by the vertical cylinder $x^2 + y^2 = 4$ and the planes $z = 0$ and $y + z = 4$. Do **NOT** evaluate the integral; just set it up.
2. Using *spherical* coordinates, set up the integral to find the volume of the region enclosed by the vertical cylinder $x^2 + y^2 = 4$ and the planes $z = 0$ and $z = 2$. Do **NOT** evaluate the integral; just set it up.
3. Consider using the substitution $\begin{cases} x = u - v, \\ y = 2u + v \end{cases}$ for the integral of $x + y^2 - 2$. What is the *integrand* in terms of u and v? (Don't bother with the integral signs, the bounds, or the $du\ dv$.)
4. Using the same substitution as in the previous problem, suppose the (x, y) region over which we wish to integrate includes the boundary line $2x - y = 3$. Convert this line into a (u, v) boundary line.