Written HW19 – MATH 3503 Fall 2021

Due by 3 November for timely completion credit

Recall that if a surface is parametrized by $\vec{r}(u, v)$, with $(u, v) \in D$ then the surface area is given by

$$A = \iint_D \|\vec{r}_u \times \vec{r}_v\| \, \mathrm{d}A.$$

1. The part of the surface $y = 4x + z^2$ that lies between the planes $x = 0$, $x = 1$, $z = 0$, and $z = 1$. **Set up but do not evaluate** the integral that computes the surface area (i.e. get it to the point of an iterated integral $\mathrm{d}u\mathrm{d}v$ or $\mathrm{d}v\mathrm{d}u$.

2. The part of the plane $x+2y+z = 4$ that lies inside the cylinder $x^2+y^2 = 4$.