0.1. **Flux through a curve.** By any means you wish, compute the flux of the vector field

$$\langle x + 2\sin^3(y), y + 3x^2 \rangle$$

through the square with corners at $(\pm 1, \pm 1)$.

0.2. **Surface Integral I.** Integrate the function $f(x, y, z) = 3z$ over the cone parameterized by

$$\begin{aligned} \vec{r}(\theta, z) =& \langle z\cos\theta, z\sin\theta, z \rangle \\ 0 \leq& \theta \leq 2\pi \\ 0 \leq& z \leq 1. \end{aligned}$$

0.3. **Surface Integral II.** Compute the flux of the vector field $\langle x, y, 0\rangle$ through the same cone from the first problem. Use any method you wish.