Problems: Flux Through Surfaces

Let \( \mathbf{F} = (x, y, z) \).

1. Find the flux of \( \mathbf{F} \) through the square with vertices \((0, 0, 0), (1, 0, 0), (1, 1, 0), (0, 1, 0)\).

2. Find the flux of \( \mathbf{F} \) through the square with vertices \((0, 0, 1), (1, 0, 1), (1, 1, 1), (0, 1, 1)\).

3. Find the flux of \( \mathbf{F} \) through the surface \( x^2 + y^2 = 1 \) with \( 0 \leq z \leq 1 \).