

Directions: Show **ALL** work for credit; Give **EXACT** answers when possible; **SIMPLIFY** your answers;

1. Let $f(x, y) = x + y$ on the rectangle $(0 \leq x \leq a, 0 \leq y \leq b)$, if $a = b = 1$, find (and simplify) $b_{m,n}$ so that f is the double Fourier sine series

$$\sum_{m=1}^{\infty} \sum_{n=1}^{\infty} b_{m,n} \sin \frac{m\pi x}{a} \sin \frac{n\pi y}{b}$$