

3. (8 points) If $f(x, y) = x \sin(xy)$, then find $\vec{\nabla} f$.

$$\vec{\nabla} f = [xy \cos(xy) + \sin(xy)] \vec{i} + x^2 \cos(xy) \vec{j}$$

4. (8 points) Graph and describe the graph of $xz = 0$ in 3-space.

The graph is the union of the yz plane together with the xz plane

