1 (10 pts). Graph the vector field \( \langle y, x \rangle \) at 25 equally spaced points in \(-2 \leq x, y \leq 2\). Hint: to make a nicer graph, try graphing \( \frac{1}{2} \) times the given vector field.

**Solution:**

1. It helps to recognize that this vector field is the gradient of the function \( f(x, y) = xy \) and that the gradient must be perpendicular to the level curves of \( f \). Here’s a graph of the vector field, including some level curves.

\[ \langle y, x \rangle \]

**Comments:** Because \( \langle y, x \rangle = \nabla f(x, y) \), we say that \( \langle y, x \rangle \) is **conservative** and that \( f(x, y) \) is its **potential**.