

Show all work. 5 points each.

1. Find the gradient vector field $F(x, y) = \nabla f$ if $f(x, y) = xy$. Plot $F(1, 0)$, $F(0, 1)$, $F(1, 1)$ and $F(-1, 1)$

2. Evaluate $\int_C xy^4 ds$ where C is the right half of the circle $x^2 + y^2 = 16$.