

MATH S1202: Calculus IV
Quiz 4
June 16, 2016

Define curves in the following way.

- Let D be the region *above the line* $y = x$ between the circles $x^2 + y^2 = 1$ and $x^2 + y^2 = 4$.
- Let C denote the boundary of D with the positive orientation. (Note that C consists of 4 arcs.)
- Let C_1 denote the piece of C lying along the circle $x^2 + y^2 = 1$.

1. Determine whether the vector field is conservative on its domain *and* if it is conservative, find a potential function.

(a) $\vec{F}(x, y) = (x^4, y^4)$

(b) $\vec{G}(x, y) = \frac{1}{x^2+y^2}(-y, x)$

2. Compute the line integral of the vector field over the curve C_1 .

(a) $\vec{F}(x, y) = (x^4, y^4)$

(b) $\vec{G}(x, y) = \frac{1}{x^2+y^2}(-y, x)$

3. Compute the line integral of the vector field over the closed curve C .

(a) $\vec{F}(x, y) = (x^4, y^4)$

(b) $\vec{G}(x, y) = \frac{1}{x^2+y^2}(-y, x)$