MATH 147 Review: Line Integrals

Facts to Know

If \( f \) is a real-valued function defined on a smooth curve \( C \subseteq \mathbb{R}^2 \), then

\[
\int_C f(x, y)\,dx = \quad \int_C f(x, y)\,dy =
\]

Examples

1. Evaluate \( \int_C (2 + x^2y)\,dy \), where \( C \) is the upper half of the unit circle \( x^2 + y^2 = 1 \) with a clockwise orientation.
2. Evaluate $\int_C 2x \, dx$, where $C$ consists of the arc $C_1$ of the line segment from $(0, 0)$ to $(1, 1)$ followed by the vertical line segment $C_2$ from $(1, 1)$ to $(1, 2)$. 