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

$$\int_C f(x,y)dx =$$

$$\int_C f(x,y)dy =$$

Examples

1. Evaluate $\int_C (2 + x^2 y)\, dy$, 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 $(1,2)$.