23 11-18-2025

23.1 Section 6.4, Checkpoint 6.34

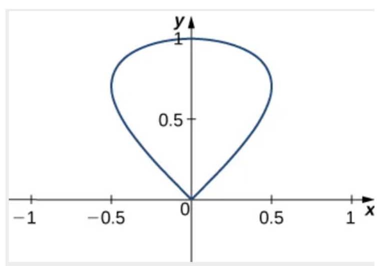
Use Green's theorem to calculate line integral

$$\int_C \sin\left(x^2\right)\, dx + (3x - y)\, dy$$

where C is a right triangle with vertices $(-1, 2), (4, 2), (4, 5)$ oriented counterclockwise.

23.2 Section 6.4, Checkpoint 6.35

Find the area of the region enclosed by the curve with parameterization $\mathbf{r}(t) = \langle \sin t \cos t, \sin t \rangle$, $0 \leq t \leq \pi$.



23.3 Section 6.4, Checkpoint 6.36

Calculate the flux of $\mathbf{F}(x, y) = \langle x^3, y^3 \rangle$ across a unit circle oriented counterclockwise.

23.4 Section 6.4, Checkpoint 6.39

Calculate $\int_{\partial D} \mathbf{F} \cdot d\mathbf{r}$ where D is the annulus given by the polar inequalities $2 \leq r \leq 5$, $0 \leq \theta \leq 2\pi$ and $\mathbf{F}(x, y) = \langle x^3, 5x + e^y \sin y \rangle$

23.5 Section 6.5, Checkpoint 6.45

Is it possible for $\mathbf{G}(x, y, z) = \langle \sin x, \cos y, \sin(x, y, z) \rangle$ to be the curl of a vector field?