
Show all work. 5 points each. Be sure to draw the region D for problem 2.

1) Use the Fundamental Theorem of Line Integrals to evaluate $\int_C \mathbf{F}(x, y) \cdot d\mathbf{r}$ where $\mathbf{F}(x, y) = \langle 3x^2 + 2y^2, 4xy + 3 \rangle$ and C is the arc of the parabola $y = x^2$ from $(1, 1)$ to $(2, 4)$

2) Use Green's Theorem to evaluate $\int_C xy^2 dx + 2x^2y dy$ where C is the triangle with vertices $(0, 0)$, $(2, 2)$ and $(2, 4)$