Green's Theorem II.

Fall 2014

Attendance Quizzes

November 19, 2014

Practice Quiz 29 Green's Theorem II.

Use Green's theorem to calculate the moment of the semicircular disc on the right side of the y-axis and inside the unit circle $x^2 + y^2 = 1$ about the y-axis.

Hint: First set up the double integral and then convert to a line integral using Green's Theorem.

Answer: We wish to find the double integral $\int\int_D x dA$ and we write x as $-P_y$ where $P = -xy$. Then we only need the integral $\int_C -xy\, dx$ where C is the right semicircle followed by the vertical line on y-axis. The integral on the line is zero and on the circle, we get $\int_{-\pi/2}^{\pi/2} cos(t)sin^2(t)dt = 2/3$.