MATH116: QUIZ X

Name:
Student Number:
Section: 2
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Question: Evaluate the line integral

$$\oint_C [(x-y)dx + xdy]$$

a) directly b) by using Green's Theorem, where C is the unit circle.

Solution:
a)

$$\oint_C [(x-y)dx + xdy] = \int_0^{2\pi} [\sin^2 t + \cos^2 t - \frac{1}{2}\sin 2t]dt = 2\pi$$

b)

$$\oint_C Mdx + Ndy = \int\int_R [N_x - M_y]dA$$

Here $M = x - y, \quad N = x$, hence

$$\oint_C [(x-y)dx + xdy] = \int\int_R 2dA = 2A(R) = 2\pi$$

$A(R)$ is the area of the unit disc.