

Math 53, Spring 2000, sections 107 & 109
Quiz #2, 28 January

Instructions: You have 25 minutes in which to answer the questions on BOTH sides of this sheet. No calculators, notes, or other references may be used.

1. (0 points) What is your name?
2. (0 points) What is your quest?
3. A coconut-laden African swallow flies for $\frac{\pi}{2}$ hours at a constant altitude along a curve C defined by the following parametric equations:

$$x = \frac{\cos t}{\sin t + \cos t} \quad (\text{leagues east of the oasis})$$

$$y = \frac{\sin t}{\sin t + \cos t} \quad (\text{leagues north of the oasis})$$

$$0 \leq t \leq \frac{\pi}{2} \quad (\text{hours}).$$

- (a) (4 points) Determine the starting position (x_1, y_1) and ending position (x_2, y_2) of the coconut-laden swallow.

- (b) (0 points) Identify the curve C .

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(c) (4 points) Set up a definite integral which expresses the arc length of the curve C .

(d) (0 points) What is the relationship between $\frac{dx}{dt}$ and $\frac{dy}{dt}$? Now can you identify the curve C ?

(e) (2 points) What is the total distance the swallow flies?

(f) (0 points) Look at your answers to parts (a) and (e). What does this tell you about the curve C (if you hadn't figured it out already)?