

Math 53 Quiz 1

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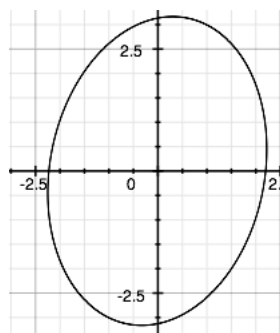
Name: _____

Consider the ellipse

$$x = \sin(t) + 2 \cos(t)$$

$$y = 3 \sin(t) - \cos(t)$$

$$t \in [0, 2\pi]$$



1. (4 pts) What is the (positive) area of the ellipse? [Hint: There are many ways to evaluate the necessary integrals. One is to recall the double-angle trigonometric identities: $\sin(2\theta) = 2 \sin(\theta) \cos(\theta)$ and $\cos(2\theta) = 2 \cos^2(\theta) - 1 = 1 - 2 \sin^2(\theta)$.]
2. (6 pts) What are the x - and y -intercepts of the line tangent to the ellipse at time t ?

Please use the back of the page as necessary. For each part, partial credit will be assigned based on correct work (you do need to show some work, enough so that I know how you solved the problem). Please simplify and box your answers.