

**MATH 166**  
**SUMMER 2012**  
**QUIZ 25**

1. (5 pt) Sketch the graph of the following parametric curves (and indicate the direction as  $t$  increases).
  - a) (5 pt)  $x = a \cos(t), y = b \sin(t), 0 \leq t \leq \pi$ .
  - b) (5 pt)  $y = a \cos(2t), x = b \sin(2t), 0 \leq t \leq \pi$ .
  - c) (5 pt)  $y = 1 - \sin^2(t), x = |\cos(t)|, 0 \leq t \leq \pi$ .
  
2. (5 pt) Consider again the parametric curve  $x = a \cos(t), y = b \sin(t), 0 \leq t \leq \pi$ .
  - a) (5 pt) Find  $dx$ .
  - b) (5 pt) Recall that the area under a curve is given by  $\int f(x) dx = \int y dx$  with appropriate limits. Apply this to find the area under the parametric curve above ( $0 \leq t \leq \pi$ ). Did you get the right sign? Why or why not?
  - c) (5 pt) Use the above (or explain how you would use the previous) to find the area enclosed by the ellipse  $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ .