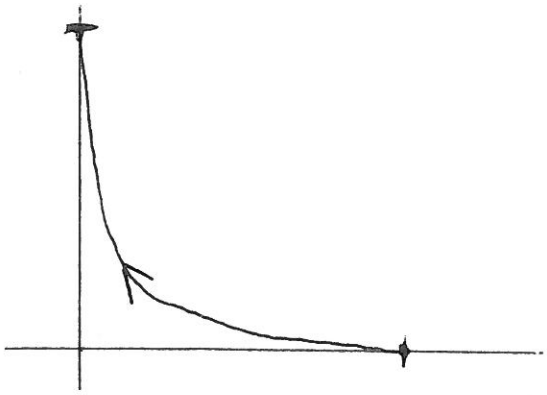
MATH 1953 Written Homework 1

Please write solutions to these problems on separate sheet(s) of paper (i.e. don't print and write on this assignment.)

1. Find a parametric form for the line segment from the point (a, b) to the point (c, d), where t ranges over the interval $[0, 1]$. (HINT: set up $x(t)$ and $y(t)$ as linear functions. You should know what $x(0)$, $x(1)$, $y(0)$, $y(1)$ are, and this is enough info to find $x(t)$ and $y(t)$!)

2. The parametric curve $x = \cos^4 t$, $y = \sin^4 t$, $t \in [0, \pi/2]$, looks like the following:



Find the area inside this curve and the first quadrant (i.e. the area between the curve and the x- and y-axes).

3. (a) Sketch the parametric curve $x = e^t \cos t$, $y = e^t \sin t$, $t \in [0, 2\pi]$. (HINT: this looks kind of like a circle, but we multiply x and y by e^t. Think about what e^t does as t ranges from 0 to 2π, and think about how that multiplication changes the graph of a circle to yield this graph.)

(b) Find the length of this curve.