

5. [12 points] Consider the graph of the curve $r = f(\theta) = 2 + 2 \cos(\theta)$.
- a. [5 points] What is the minimal value of x taken by the points on the graph of $f(\theta)$? Show appropriate work to justify your answer.
- b. [3 points] Consider the vertical line $x = a$, where a is the value you found in part (a). Sketch the region bounded by $x = a$ and the graph of $f(\theta)$. Be sure to label your axes and graph appropriately.
- c. [4 points] Find inequalities for θ and r that describe the region bounded in part (b).