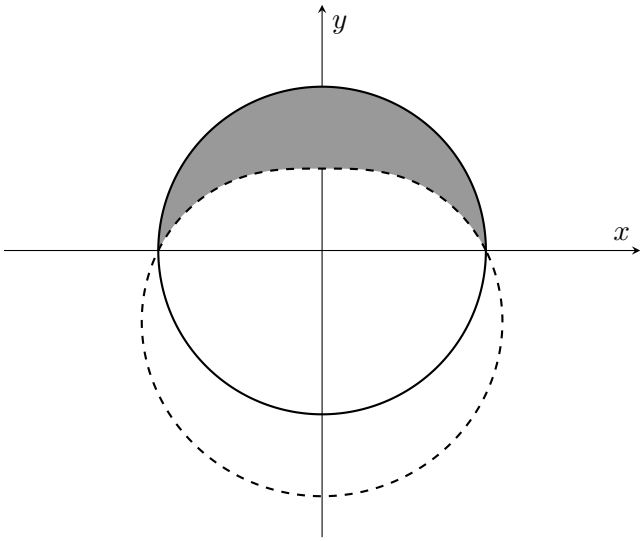
7. [10 points] Nowadays, David's haircut is more simplistic. In a poster for a more recent album, David's haircut is given by the shaded region below. The solid curve is a circle centered at the origin with radius 2, while the dashed curve is given by the equation $r(\theta) = 2 - \sin(\theta)$, where $0 \leq \theta \leq 2\pi$.



a. [2 points] Find the two intersection points of the two curves in the diagram. Express the intersection points in polar coordinate form (r, θ), where $r > 0$ and $0 \leq \theta < 2\pi$.

Answer: _____ and _____

b. [4 points] Write an expression involving one or more integrals that gives the total perimeter of the shaded region. Your final answer should not involve the letter r. Do not evaluate your integral(s).

Answer: _____

c. [4 points] Write an expression involving one or more integrals that gives the area of the shaded region. Your final answer should not involve the letter r. Do not evaluate your integral(s).

Answer: _____