

## Problem 1

Find the area between the curves  $r = 3 - \cos(\theta)$  and  $r = 1 - \cos(\theta)$  from  $0 \leq \theta \leq 2\pi$ .

## Problem 2

Find the length of the cardioid  $r = 1 + \cos(\theta)$ .

(Hint:  $\frac{1 + \cos(2\theta)}{2} = \cos^2(\theta)$  )

(Another Hint: By symmetry, you can get away with integrating from 0 to  $\pi$  and multiplying your answer by 2. This makes dealing with the absolute value easier.)