Problems On Evolutes and Involutes

Problem 1: Draw the parametrized curve:

$$\begin{cases} x = r(t - \sin t) \\ y = r(1 - \cos t) \end{cases}$$

Where t parametrizes the curve and r is just some positive number (you can take $r = 1$). This curve is called the cycloid.

Problem 2: Find a natural parametrization of this curve. You can look only at the interval from $t = 0$ to $t = 2\pi$.

Reminder: A natural parametrization is such a parametrization that the lenth of the curve from $t' = 0$ to $t' = s$ is equal to s.

Problem 3: Find and draw the evolute of this curve. Does it remind you of something?