3. [9 points] Consider the curve $\mathcal{C}$ defined by

$$\cos(ax - y) + x^2 + y^2 = b$$

where a and b are positive constants.

  a. [5 points] For the curve $\mathcal{C}$, find a formula for $\dfrac{dy}{dx}$ in terms of x and y. The constants a and b may appear in your answer. To earn credit for this problem, you must compute this by hand and show <u>every</u> step of your work clearly.

Answer: $\dfrac{dy}{dx} =$ _____

  b. [1 point] Let $a = 1$ and $b = 9$. Exactly one of the following points (x, y) lies on the curve $\mathcal{C}$. Circle that <u>one</u> point.

$$(3, 0) \qquad (2, 2) \qquad (1, -1) \qquad (\pi, \pi) \qquad (0, -9)$$

  c. [3 points] With $a = 1$ and $b = 9$ as above, find an equation for the tangent line to the curve $\mathcal{C}$ at the point you chose in part **b.**.

Answer: $y =$ _____