Problem 1. *Consider the equation $x^4 + y^4 = 16$.*

(a) Sketch the set of points that satisfy this equation.

(b) Find $y'(x)$ directly (by solving for y).

(c) Use implicit differentiation to find y' and y'' (your answer may include y).

Problem 2. *If $x^2 + xy + y^3 = 1$, find the value of y'' at the point where $x = 1$.*

Problem 3. *Compute $\dfrac{d}{dx}\left(\dfrac{1}{\arcsin(2x) + x^2}\right)$.*

Problem 4. *Find the tangent line to the ellipse $x^2 + xy + y^2 = 3$ at the point $(1, 1)$.*

Problem 5. *Compute $\arctan'(x)$.*