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Let y be defined implicitly as a function of x by the equation $y^4 + xy + x^3 = 1$.

1. Compute dy/dx .
2. Find the tangent line at $(1, 0)$.

1. $y^4 + xy + x^3 = 1$ differentiated gives

$$4y^3 \frac{dy}{dx} + y + x \frac{dy}{dx} + 3x^2 = 0$$

$$(4y^3 + x) \frac{dy}{dx} + (y + 3x^2) = 0$$

$$\frac{dy}{dx} = - \frac{y + 3x^2}{4y^3 + x}$$

2. $y'(1) = - \frac{0 + 3(1)^2}{4(0)^3 + 1} = -3$

so the tangent line is

$$y - 0 = (-3)(x - 1)$$

$$y = -3(x - 1)$$