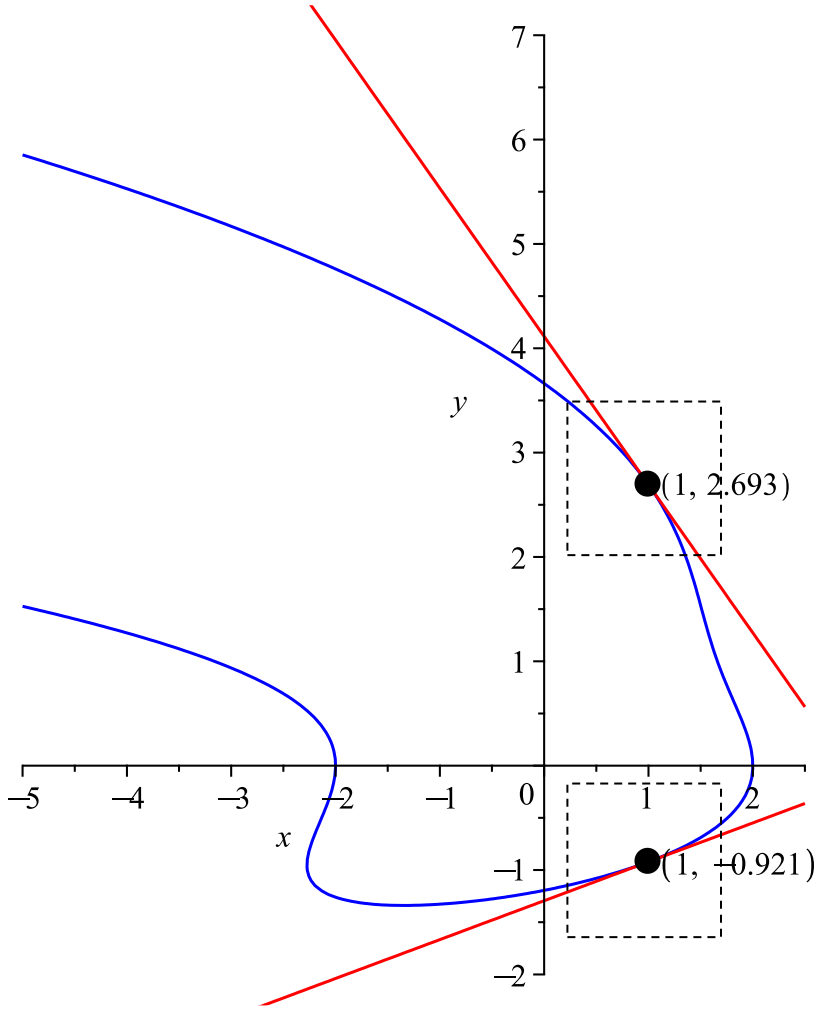
Implicit Differentiation Example

Consider the equation: $4x^2 - 7y^3 + 2y^4 + 6xy^2 = 16$

The graph of this equation is given below. Here y is defined implicitly in terms of x. However, y is not a function of x since, for example, if $x = 1$, then $y \approx 2.693$ or $y \approx -0.921$. Nevertheless, smaller segments of the graph such as those portions in the square boxes can be represented by a differentiable function and at each point along these segments dy/dx represents the slope.



Exercise: Find the slope of the graph at the points (i) $(1, 2.693)$ and (ii) $(1, -0.921)$.
[Answer: (i) -1.420 (ii) 0.373]