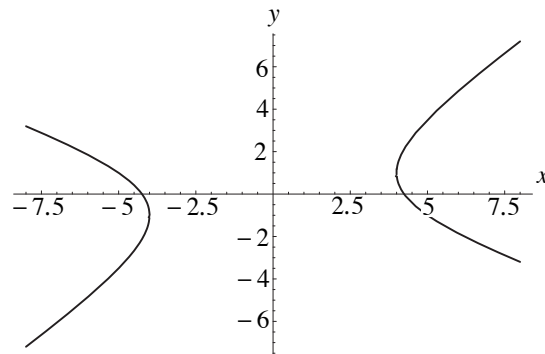


3. (18 points) Below is a graph of the curve implicitly defined by the equation

$$2y^2 - xy - x^2 = -18.$$



(a) Find a formula for $\frac{dy}{dx}$ as a function of both x and y .

(b) Find the value of $\frac{dy}{dx}$ at the point $(5, -1)$.

(c) Find any points (x_0, y_0) where $\frac{dy}{dx}$ is undefined, or give justification why no such points exist.

(d) Find any points (x_0, y_0) where $\frac{dy}{dx} = 0$, or give justification why no such points exist.