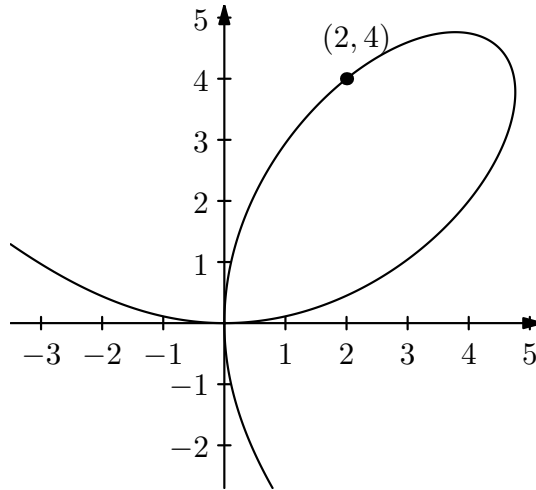


1. Consider the curve $x^3 + y^3 - 9xy = 0$.

(a) Show that the point $(2,4)$ lies on the curve.

(b) Find an equation (in Taylor form) for the tangent to the curve at $(2,4)$.

(c) Find an equation (in Taylor form) for the normal to the curve at $(2,4)$.



2. *A Pair of Pairs*

(a) We know that when $y = e^x$, $\frac{dy}{dx} = e^x$.

Demonstrate how to use this fact to find the derivative of $y = \ln x$.

(b) We know that when $y = \sin(x)$, $\frac{dy}{dx} = \cos(x)$.

Demonstrate how to use this fact to find the derivative of $y = \arcsin(x)$.

(c) Spend some time discussing why did I call this question *A Pair of Pairs*.

3. Demonstrate how to find $\frac{dy}{dx}$, when:

(a) $y = \arccos(x)$

(b) $y = \arctan(x)$