

## Steps to Finding the Derivative with Implicit Differentiation

1. Differentiate both sides with respect to  $x$ .
2. Combine all  $dy/dx$  terms on left side of equation and all other terms on the right side.
3. Factor out  $dy/dx$  from terms on left side.
4. Solve for  $dy/dx$ .

Find  $\frac{dy}{dx}$  for the following equations

$$x^2 + y^2 = 9$$

$$2y^2 + 5y + 4x = 2$$

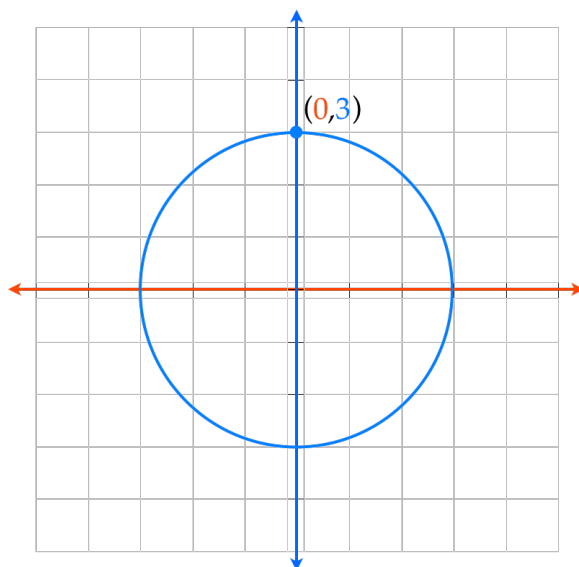
Find  $\frac{dy}{dx}$  for the following equations

$$y^3 + y^2 - 5y - x^2 = -4$$

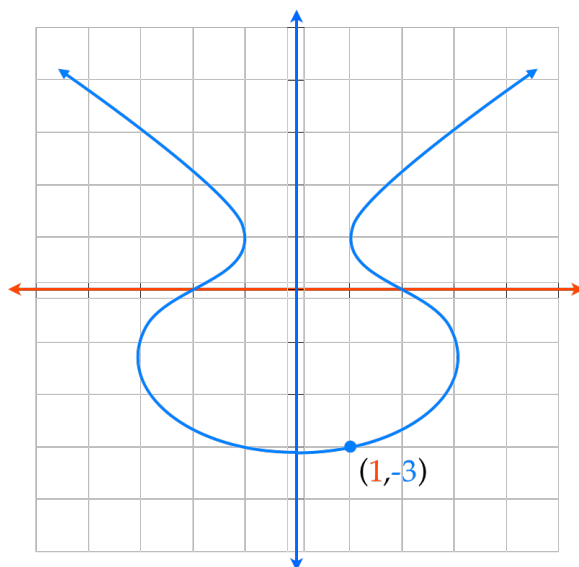
Find  $\frac{dy}{dx}$  for the following equations

$$\sin y \cos x = 3x$$

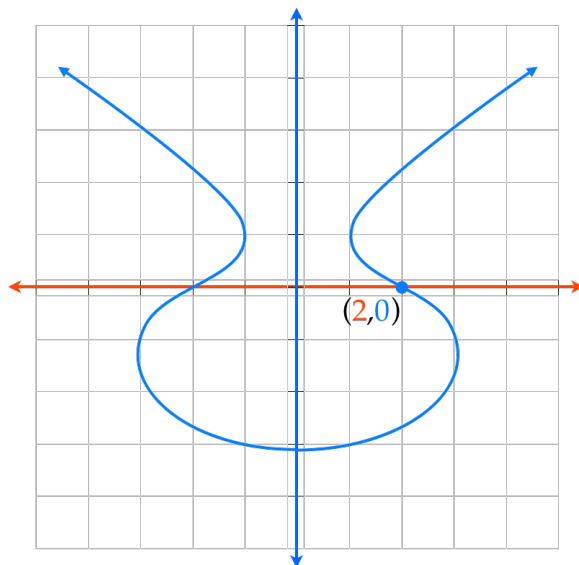
Find the equation of the **tangent line** to the graph of  $x^2 + y^2 = 9$  at point  $(0,3)$



Find the equation of the **tangent line** to the graph of  $y^3 + y^2 - 5y - x^2 = -4$  at point  $(1,-3)$ .



Find the equation of the **tangent line** to the graph of  $y^3 + y^2 - 5y - x^2 = -4$  at point  $(2,0)$ .



Find  $\frac{d^2y}{dx^2}$  for the following equations

$$x^2 + y^2 = 16$$