

4. Determine the point(s) at which the graph of  $y^4 = y^2 - x^2$  has either a horizontal or vertical tangent. Be sure to label which is which, if either exist.

5. Find the two points where the curve  $x^2 + xy + y^2 = 7$  crosses the  $x$ -axis, and show that the tangents to the curve at these points are parallel. What is the common slope of these tangents?

6. Find the equations of the normal lines to the curve  $xy + 2x - y = 0$  that are parallel to the line  $2x + y = 0$

7. If  $y^2 + \cos xy - 4x = 5$ , find  $\frac{dx}{dy}$ , yes, that's  $\frac{dx}{dy}$ .

8. The slope of the tangent is  $-1$  at the point  $(0,1)$  on  $x^3 - 6xy - ky^3 = a$ , where  $k$  and  $a$  are constants. The values of the constants  $a$  and  $k$  are what?