

AUTHOR 1 \_\_\_\_\_

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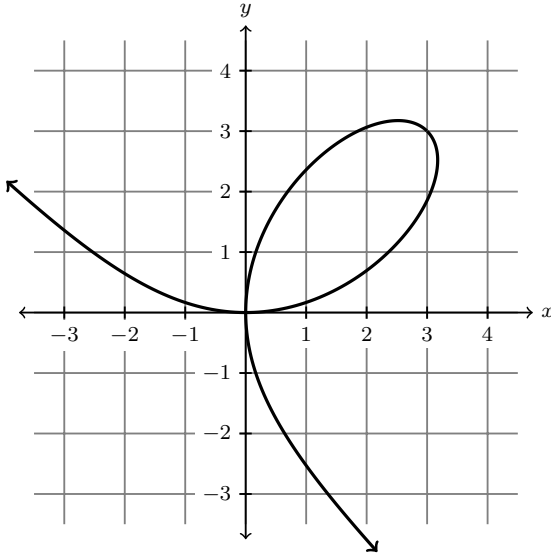
AUTHOR 3 \_\_\_\_\_

AUTHOR 4 \_\_\_\_\_

# Worksheet 10

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1. The graph of the equation  $x^3 + y^3 = 6xy$  is below.



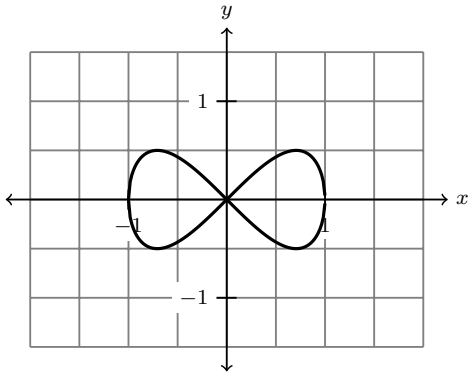
(a) Is this the graph of a *function* of  $x$ ? Explain.

(b) Use the equation to show that  $(3, 3)$  is on the graph.

(c) Use implicit differentiation to find a formula for  $\frac{dy}{dx}$ . (The formula will contain  $x$ 's and  $y$ 's.)

(d) Find an equation for the tangent line to the curve at the point  $(3, 3)$ .

2. The graph of the equation  $y^2 = x^2 - x^4$ .



(a) Is this the graph of  $y = \sqrt{x^2 - x^4}$ ? Explain.

(b) Illustrate on the graph everywhere that the tangent line is horizontal.

(c) Use implicit differentiation to find a formula for  $\frac{dy}{dx}$ . (The formula will contain  $x$ 's and  $y$ 's.)

(d) Find all points where the tangent line to the curve is horizontal.

3. Find  $\frac{dy}{dx}$ .

(a)  $xy + \arctan(y) = e$

(b)  $y = \sin^{-1}\left(\frac{1-x}{1+x}\right)$