

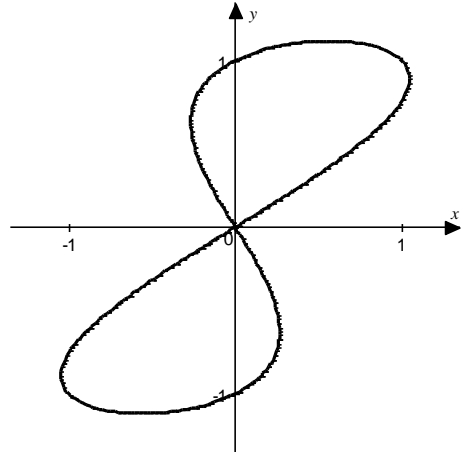
AP CALCULUS AB
Supplement 2.7
Implicit Differentiation

Name _____
Date _____
Period _____

Consider the curve C , defined by $y^4 - xy = y^2 - x^2$, represented by the graph below.

1. Calculate $\frac{dy}{dx}$ *without* the use of a calculator.

2. Find the equation for the line tangent to C at the point $(0, 1)$ *without* the use of a calculator.



3. Find $\left. \frac{d^2y}{dx^2} \right|_{(-1,-1)}$ *without* the use of a calculator.

4. *Using* a calculator, find the coordinates for all horizontal tangent lines to C .

5. *Using* a calculator, find the coordinates for all vertical tangent lines to C .

6. *Using* a calculator, find the coordinates for all tangent lines to C with slope -1 .

Supplement 2.7 Answers

1. $\frac{dy}{dx} = \frac{y-2x}{4y^3-2y-x}$

2. $y-1 = \frac{1}{2}x$ OR $y = \frac{1}{2}x+1$

3. 14

4. $\left(\frac{\sqrt{5}}{4}, \frac{\sqrt{5}}{2}\right), \left(-\frac{\sqrt{5}}{4}, -\frac{\sqrt{5}}{2}\right)$

5. $(-1.047, -0.891), (1.047, 0.891), (-0.267, 0.627), (0.267, -0.627)$

6. $(-1, -1), (0, 0), (1, 1)$