

Implicit Differentiation

Goal:

- Can use implicit differentiation with chain rule
- Can describe the process for implicit differentiation

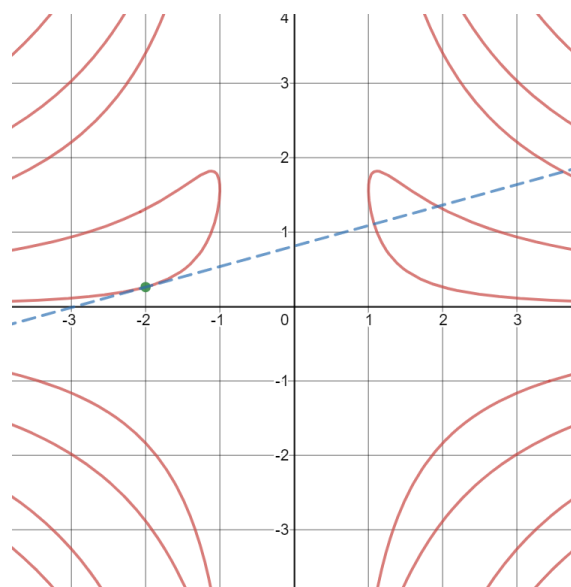
Terminology:

- Implicit Differentiation

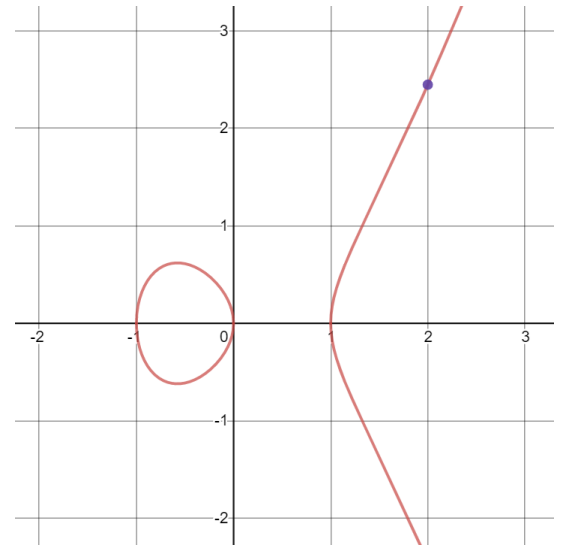
We are going to have a taste of calc 3 (multivariable calculus) by considering *relationships* of two or more variables rather than functions of one variable.

Consider the relation $f(x, y) = x \cdot \sin(xy)$, what does this even look like?

For now we only want two variables and so we set $f(x, y) = 1$ (or some other constant so the relation is frozen in the x, y plane) and then ask ourselves: What is the slope of the curve at the point $(-2, 0.262)$?



Example: Determine the slope of the curve $y^2 = x^3 - x$ at the point $(2, \sqrt{6})$



Example: Show that power rule works for any $n \in \mathbb{Q}$

Practice Problems: 3.7: # 1-20 (do what you need), 27-36 (do what you need), 37a, 38, 39, 41, 46



42, 47, 50

Look Ahead: What is the derivative of $\arcsin x$?