MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

Assignment 6

MATHEMATICS 1000

Fall 2024

Due: Friday, November 1st, 2024 at 11:59pm. See the Gradescope Handout for submission information.

Note: You should complete the WeBWorK problem sets "Implicit Differentiation" and "Derivatives of Logarithmic Functions" as well as Worksheets 3.3 and 3.4, before you work on this assignment.

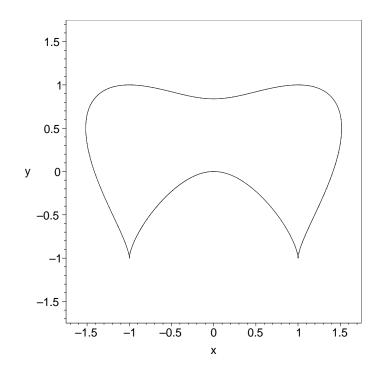
1. Find $\frac{dw}{dt}$ given

$$t^2w^3 + 9t = \sin(tw) - 4.$$

2. The curve defined by the equation

$$(1-y^2)(y+1)^2 = (x^2-1)^2$$

is known as a bicuspid. (Its graph is shown below.) Find the equation of the tangent line at the point $(\sqrt{2},0)$.



3. Differentiate each of the following.

(a)
$$y = \ln\left(\frac{x^7}{\sqrt{x\sec(x)}}\right)$$

(b)
$$y = [\tan(3x)]^{\sqrt{x}}$$