

Name and surname:

U number:

## Calculus I - MAC 2311 - Section 003

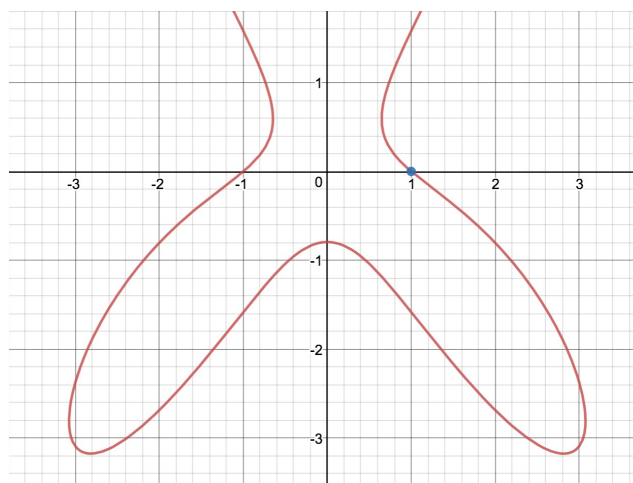
### Quiz 4

10/03/2018

**Instructions:** The total number of points of this quiz is 12, but your grade will be the minimum between your score and 11.

1) [6 points] Consider the curve  $\mathcal{C}$  given by the equation

$$x^4 - 2y^3 = 1 - 5x^2y.$$



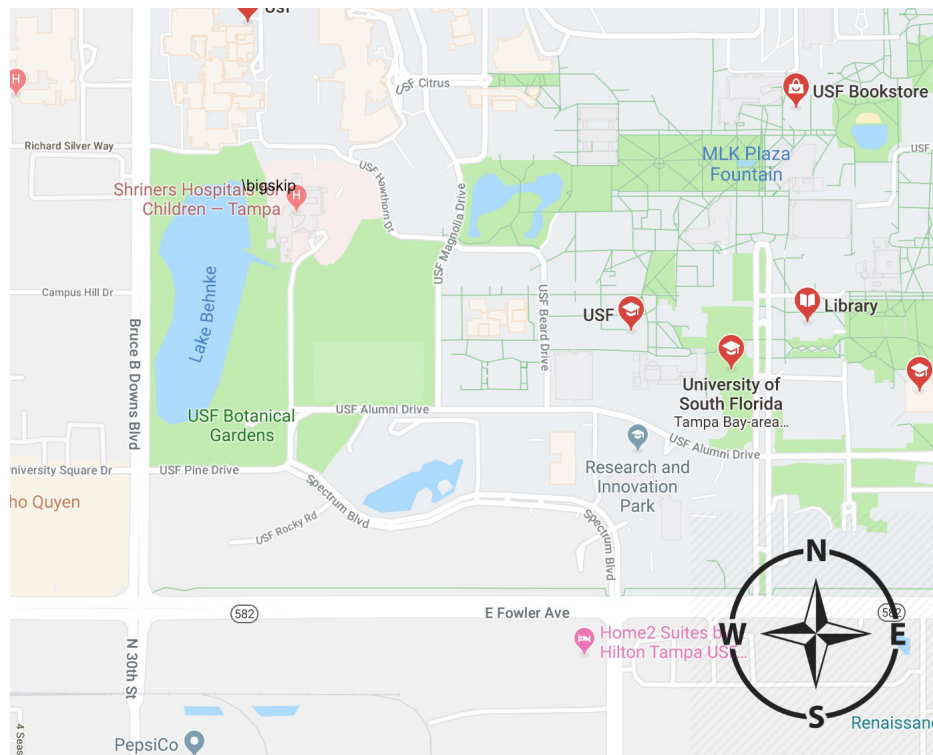
a) On the picture above, draw the tangent line to  $\mathcal{C}$  at the point  $(1, 0)$ .

b) Use implicit differentiation to find  $\frac{dy}{dx}$ .

c) Find an equation of the tangent line to the above curve at the point  $(1, 0)$ .

d) Is your answer for (c) consistent with your “answer” for (a)? Why or why not?

- 2) [6 points] A couple of alligators meets at the intersection of Bruce B. Downs Blvd and Fowler Ave for organizing a romantic dinner. The male alligator starts running east at a speed of 0.4 miles per minute to chase a USF student. At the same time the female alligator starts running north at a speed of 0.3 miles per minute to chase a USF instructor. At what rate is the distance between the two alligators increasing after 5 minutes?



a) Sketch quickly the geometric situation described by the problem on the map above.

b) Name and describe the quantities of the problem (and attach them the corresponding units).

c) Write what you know and what you want to find.

d) Write an equation that relates the quantities found in (b).

e) Solve the problem (do not forget the units in your final answer).