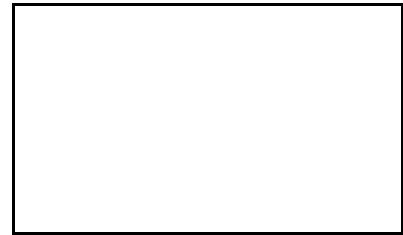


1. Consider the function $f(x) = x^{(x^3-4x)}$ (You can write $y = x^{(x^3-4x)}$ if you prefer).

1A: Use logarithmic differentiation to find the derivative f' of f . (You can write y' and y if you like). Express the result in terms of x .

1B: Use the answer to 1A to find the slope of the line tangent to the graph of f at the point $(1, f(1))$. Show all your steps.

1C: Have your calculator draw the graph of f in the window $[Xmin, Xmax] \times [Ymin, Ymax] = [-1, 3] \times [-1, 5]$ and make an excellent facsimile of the result in the space to the right:



1D: Using the calculator's "maximum" function (it's on the same menu as the "zero" function) to locate the x -coordinate of the local max you see in 1C. Tell me what you used for your LeftBound, RightBound and your Guess, then also give me the value of x and y at that point (to as many places as your calculator gives you).

LeftBound = RightBound = Guess =

x coord of local max: y coord of local max:

2. Let $f(x) = x^3 \sin(5x)$.

2A. Find $f'(x)$ using the product and chain rules in the usual way.

2B. Find $f'(x)$ using logarithmic differentiation, and simplify the result so it's the same as in 2A. *Show all your steps!*