

TMATH 124pm: Quiz 4

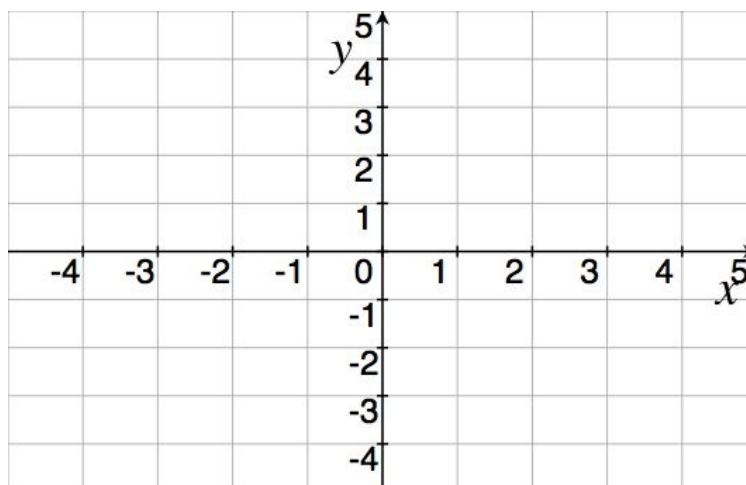
Show *all* your work (numerically, algebraically, or geometrically) for each and simplify. No credit is given without supporting work.

1. [3] (extreme wks #1) Sketch the graph of an example function f that satisfies all of the following conditions:

(a) f is continuous on the interval $[-3, 4]$

(b) $x = -1$ and $x = 2$ are critical numbers.

(c) the only local extrema (maximums or minimums) occur when $x = -1$ or $x = 4$.



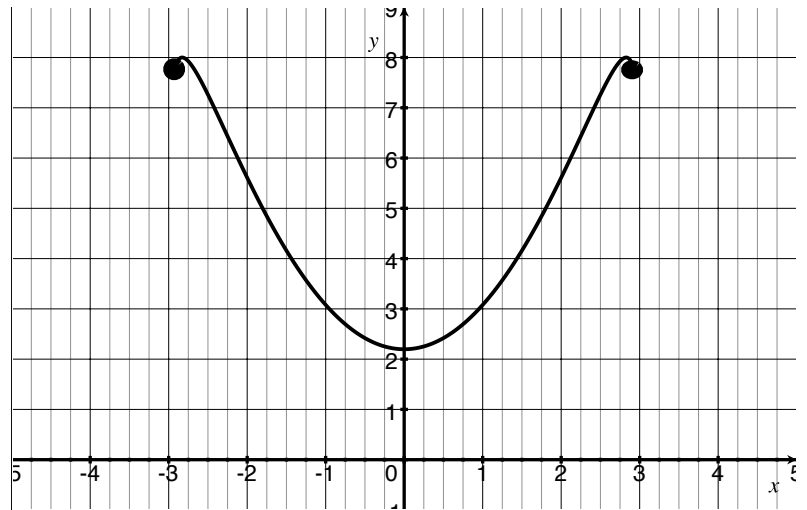
2. [2] (Lecture /28) Given that the function g is:

- continuous on $[0, \infty)$
- differentiable on $(0, \infty)$
- evaluates to 2 when given the input 1, and
- that $g'(x) \leq 3$ for all x ,

find an upper bound for $g(5)$. Explain yourself or provide supporting work.

3. Consider the graph of $h(x) = \ln(e^{(x^2)}(9 - x^2))$ on the interval $[-2.9, 2.9]$.

(a) [1] (§4.1 #66) Use the graph of h shown to the right, to *estimate* the x values of all absolute maximums.



(b) [2] (§3.6 #8) Find $h'(x)$ and simplify.

(c) [2] (§4.1 #66) Calculate the *exact* x -values that correspond to the absolute maximums of h .