

## Math 190 Homework 5: Due Monday October 17

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*The assignment is due at the beginning of class on the due date. You are expected to provide full solutions, which are laid out in a linear coherent manner. Your work must be your own and must be self-contained. Your assignment must be stapled with your name and student number at the top of the first page. Enjoy this short assignment for this short week!*

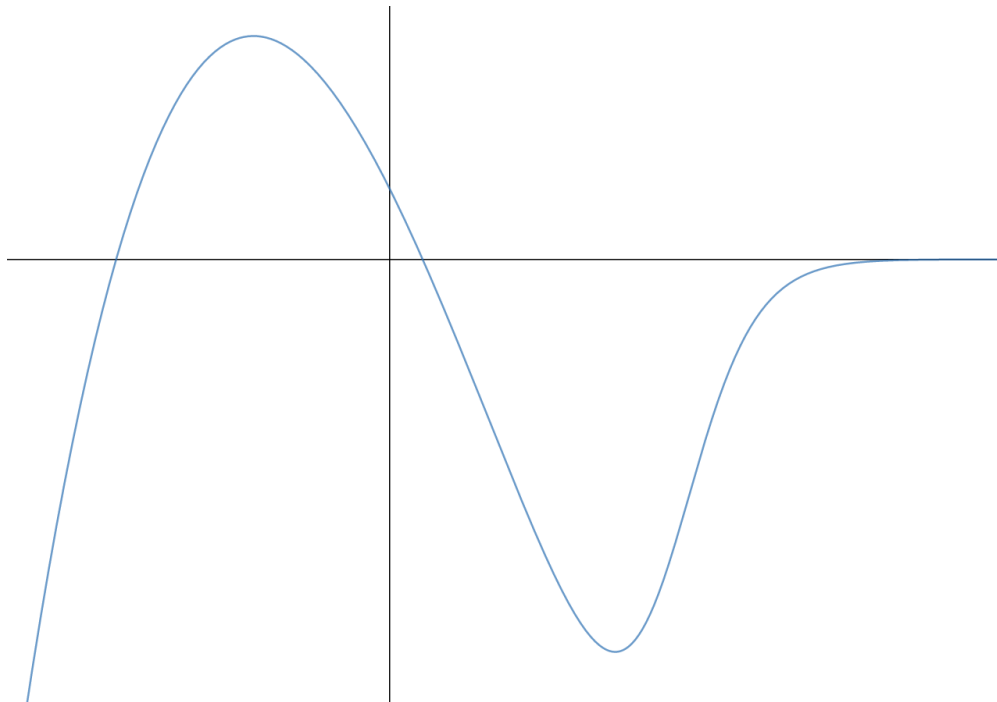
### Questions:

1. Find all vertical and horizontal asymptotes of the following functions. Ensure you compute (and show the computation of) all the relevant limits.

(a)  $\frac{x - 4}{x^2 - 2x - 8}$

(b)  $\frac{e^x}{e^x + 2}$

2. Consider the following graph of  $f(x)$ :



Sketch the graph of its derivative. Do so by considering the slope of the above graph and how it changes.

3. Using the limit definition of the derivative (and not any other method) find the derivative of the function

$$g(x) = \frac{x - 1}{x}$$

and use it to compute the equation of the tangent line to  $g(x)$  at  $x = 3$ .