§4.2 (part 1): Increasing/Decreasing and First Derivative Test

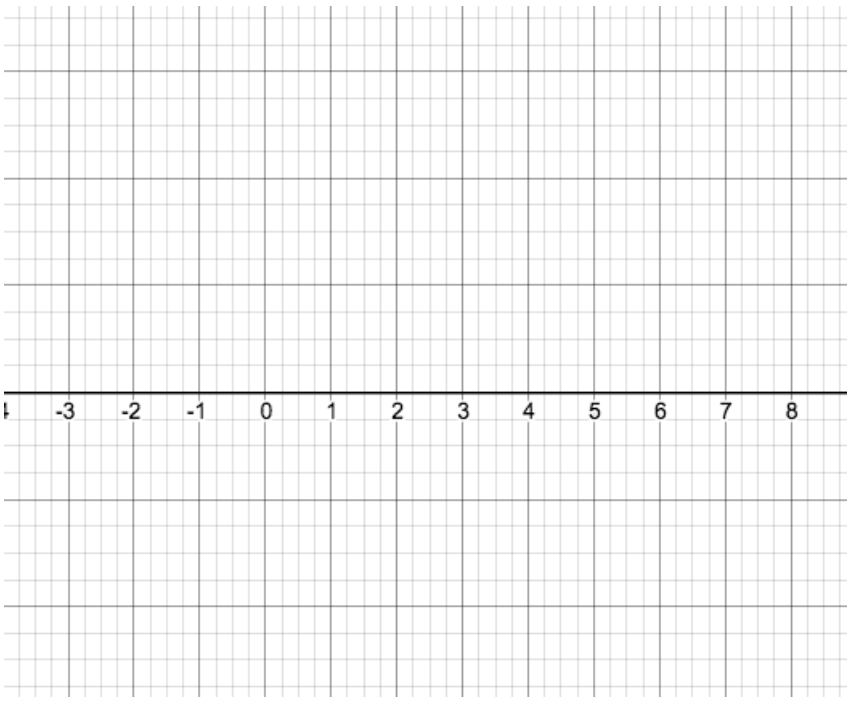
1.] Sketch a function f that is continuous on $(-\infty, \infty)$ and satisfies the following conditions:

a.) $f'(x) > 0$ for x in the intervals $(-\infty, 0)$, $(4, 6)$, and $(6, \infty)$.

b.) $f'(x) < 0$ for x in the interval $(0, 4)$.

c.) $f'(0)$ is not defined.

d.) $f'(4) = f'(6) = 0$.



2.] Determine the intervals on which the function $f(x) = x^2 e^{-x/2}$ is increasing and decreasing.

3.] For the following functions, locate the critical values of f, use the First Derivative Test to locate the local extrema, and identify the absolute maximum and minimum values of the function on the specified interval (if they exist).

a.) $f(x) = 2x^5 - 5x^4 - 10x^3 + 4$ on $[-2, 4]$.

b.) $f(x) = x^{2/3}(5 - x)$ on $[-8, 8]$.