9. (12 points) On the axes below, sketch a function f satisfying all the following properties. Be careful to label all important points on the axes.

   - f has a vertical asymptote at $x = 4$
   - f is continuous on $(-\infty, 4)$ and on $(4, \infty)$
   - $f'(x) > 0$ and $f''(x) > 0$ for all x in $(-\infty, 0)$
   - $f(0) = 2$
   - f is not differentiable at $x = 0$
   - $f''(x) > 0$ for all x in $(0, 2)$
   - $f'(2) > 0$
   - $f''(x) < 0$ for all x in $(2, 4)$
   - For all $x > 4$, f is decreasing and is concave up
   - $\lim_{x \to \infty} f(x) = 1$

   One possible solution is shown below.