

8. (10 points) On the axes below, sketch a graph of a single, continuous, twice differentiable function  $f$  with all of the following properties. Be sure to clearly label your axes.

- $f(0) = 0$  and  $\lim_{x \rightarrow \infty} f(x) = 4$
- $f'(x) = 0$  for  $x = -2, 3$
- $f'(x) \geq 0$  for  $-\infty < x < 3$
- $f'(x) < 0$  for  $x > 3$
- $f''(x) = 0$  for  $x = -2, 1, 5$
- $f''(x) > 0$  for  $-2 < x < 1$
- $f''(x) < 0$  for  $-\infty < x < -2$  and  $1 < x < 5$

