2. (7+2+3 points) (a) On the axes below, sketch a graph of a single, continuous, differentiable function, \( g \), with all of the following properties.

- \( g(0) = 2 \)
- \( g' \) is negative for \( x < 0 \) and \( x > 4 \)
- \( g \) is increasing for \( 0 < x < 4 \)
- \( g'' \) is positive for \( x < 3 \)
- \( g'(4) = 0 \)
- \( g(x) \to 5 \) as \( x \to \infty \)

(b) What is \( \lim_{x \to -\infty} g(x) \)?

(c) If \( g'(1) = 1/2 \), is it possible to have \( g'(2) = 1/4 \)? Explain.