5. The graph on the left below (Figure 1) depicts a derivative function, \( f' \). The graph indicates the full behavior of \( f' \) — i.e., \( f' \) does not have changes in direction that are not shown in the figure.

![Figure 1: graph of \( f' \)](image1)

![Figure 2: graph of \( f'' \)](image2)

(a) (4 points) Using the axes provided in Figure 2 above, sketch a graph of \( f''(x) \).

(b) (4 points) On which interval(s) is the original function \( f \) increasing?

On \([-3, 1]\) and \([2, \infty)\) (or with open intervals).

(c) (2 points) On which which interval(s) is \( f \) concave up?

On \((-\infty, -1.5]\) and \([1.5, \infty)\) (or with open intervals).

(d) (4 points) If \( f(-2) = 3 \), approximate \( f(-1) \).

Since the slope at \( f'(-2) = 6 \), we have

\[
    f(-1) \approx f(-2) + 6 = 3 + 6 = 9
\]