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.

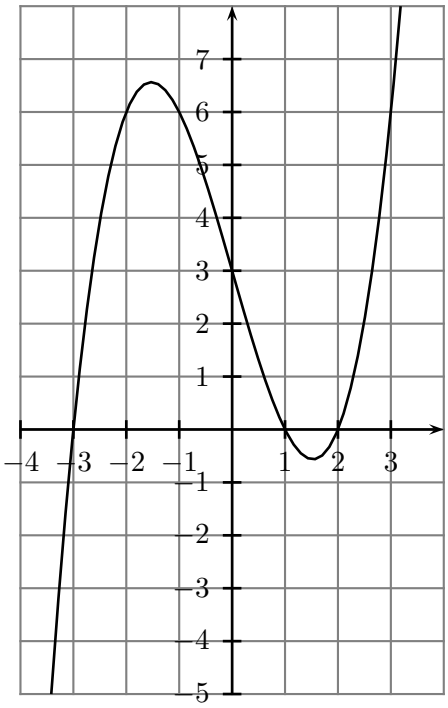

Figure 1: graph of f'

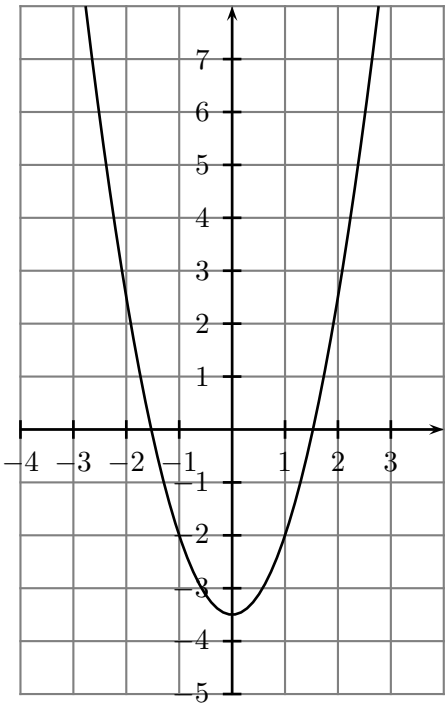

Figure 2: graph of f''

(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

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