Below is a graph of the derivative, $f'(x)$, for some function $f(x)$. Answer the following questions using this graph and what you know about derivatives. Note that the $x$ and $y$ axis are not labeled, so you should draw these in where $y = 0$ and $x = 0$ to make it easier to visualize the graph.

![Figure 1. Graph of $f'(x)$](image)

(1) What information can $f'(x)$ tell us about the graph of $f(x)$?

(2) What can you say about $f'(x)$ at at $x = -3$ and $x = -1$? What does this tell us about the graph of $f(x)$ at $x = -3$ and $x = -1$?
(3) Where is $f(x)$ increasing? Decreasing? Give your answer in interval notation.

(4) What information does the second derivative, $f''$, tell us about the graph of $f'(x)$? Of $f(x)$?

(5) Is the graph of $f(x)$ concave up or down at $x = -3$? At $x = -1$? (i.e. is $f''$ positive or negative at these points?)
(6) Using parts (2), (3), and (5), determine the local minima and maxima of $f(x)$.

(7) What happens to the concavity of the graph of $f(x)$ at $x = -2$?

(8) Based on your answers for parts (1)-(7), sketch a graph of $f(x)$. 