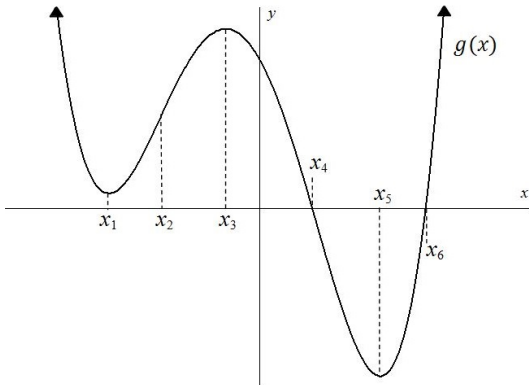


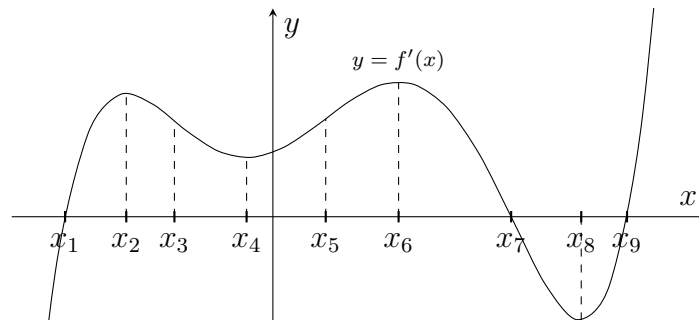
1. (4) Use the graph of $g(x)$ below to answer the following questions.



At which marked x -value(s) can the following statements be true?

- a) $g'(x)$ is decreasing _____
- b) Slope of $g(x)$ is positive _____
- c) Slope of $g(x)$ is increasing _____
- d) $g'(x)$ is the least _____

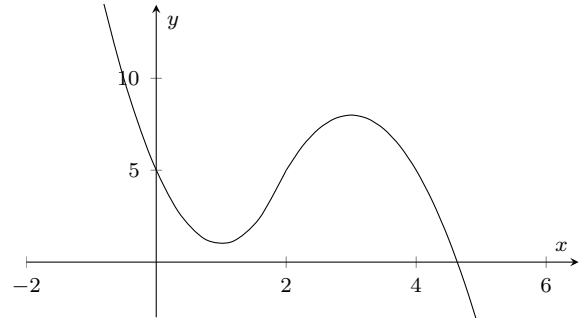
2. (8) Consider the graph of $f'(x)$ shown below.



- (a) On what interval(s) is $f(x)$ increasing?
- (b) At which marked x -value is $f(x)$ decreasing the fastest?
- (c) On what interval(s) is the graph of $f(x)$ concave down?
- (d) At which marked x -value is $f(x)$ the greatest?

Make sure to use the definition of differentiable (i.e. there needs to be some limits) for numbers 3 and 4.

3. (4) Consider the function $f(x) = \begin{cases} 4(x-1)^2 + 1 & \text{for } x \leq 2 \\ -3(x-3)^2 + 8 & \text{for } x > 2 \end{cases}$ whose graph is shown below. Determine whether $f(x)$ is differentiable at $x = 2$. If so, find $f'(2)$.



4. (4) Determine whether or not the function $g(x) = (x + |x|)^2 - 1$ is differentiable at $x = 0$. If so, find $g'(0)$.