Show all your work. No calculators, no books/notes are allowed.
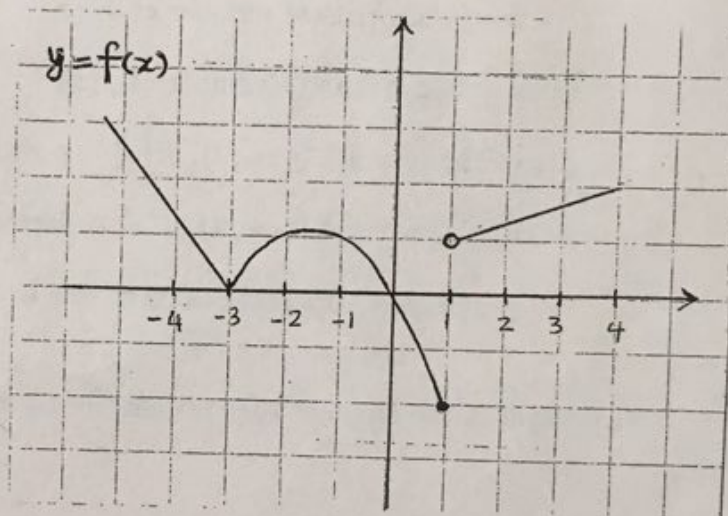
Name (please print): _____

Student number: _____

1. Consider the function $f(x)$ with the following graph.

   (a) Choose the interval(s) in which the Mean Value Theorem applies. (There might be more than one interval.) Give reasons for the interval(s) that you do NOT choose.

   i. $[-3, -1]$

   ii. $[-4, -1]$

   iii. $[-1, 2]$

   iv. $[2, 3]$

   (b) Is there any interval in which you can apply Rolle's Theorem for the function f? If yes, write the interval, if no state why not.

2. Below, the graph of the derivative function, $f'(x)$, is given.
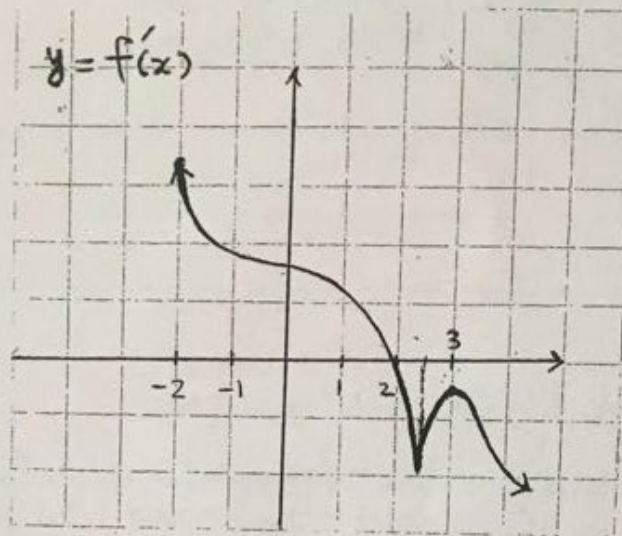
(a) Use the graph and check all the statements that are correct.

    i. $x = 3$ is a critical number of $f(x)$.

    ii. $x = 2$ is a critical number of $f(x)$.

    iii. In the interval $(-\infty, 2)$, $f'(x)$ is positive so $f(x)$ is increasing.

    iv. In the interval $(-\infty, 2)$, $f(x)$ is decreasing.

    v. $f(x)$ has a horizontal tangent line at $x = 2$.

(b) What is the slope of the tangent line at $x = 2.5$?