

10. [9 points] A table of some values of the function  $f(x)$  and its first and second derivatives is given below. The functions  $f(x)$ ,  $f'(x)$ , and  $f''(x)$  are continuous everywhere.

$x$	-4	-3	-2	-1	0	1	2	3	4	5
$f(x)$	-0.6	0	-0.3	-2	-3	-1	0	3	88	204
$f'(x)$	3	0	-1	-2	0	2	0	9	80	0
$f''(x)$	-8	0	-2	0	4	0	0	22	0	-74

Assume that the critical points of  $f(x)$  and  $f'(x)$  are as follows, with no additional critical points besides those listed:

critical points of  $f(x)$ :  $-3, 0, 2, 5$

critical points of  $f'(x)$ :  $-3, -1, 1, 2, 4$

- a. [4 points] Find all local extrema of  $f(x)$ , and classify each as a max or a min. If there are none of a particular type, write NONE. *No justification is necessary, although limited partial credit may be awarded for work shown.*

**Answer:** Local min(s) at  $x =$  \_\_\_\_\_

**Answer:** Local max(es) at  $x =$  \_\_\_\_\_

- b. [3 points] Find all global extrema of  $f(x)$  on the interval  $[-4, 3]$ , and classify each as a max or a min. If there are none of a particular type, write NONE. *No justification is necessary, although limited partial credit may be awarded for work shown.*

**Answer:** Global min(s) at  $x =$  \_\_\_\_\_

**Answer:** Global max(es) at  $x =$  \_\_\_\_\_

- c. [2 points] Circle all intervals below on which  $f(x)$  must be concave down on the entire interval.

(-4, -2)      (-3, -1)      (-1, 0)      (4, 5)      (5,  $\infty$ )      NONE OF THESE