Date: _____

4.3 Connecting f' and f'' with the Graph of f

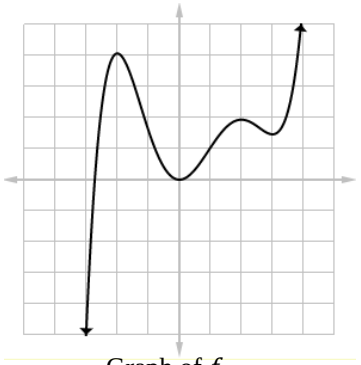
Example 1:

Determine the local extreme values of the function and the type of relative extrema and find any inflection points. Check your answer graphically.

$$f(x) = -2x^3 + 6x^2 - 3$$

Example 2:

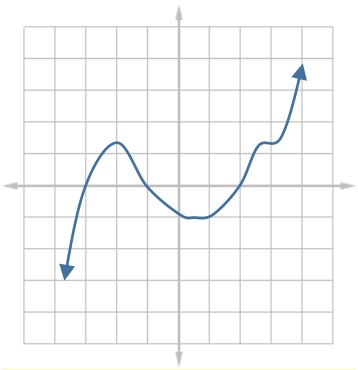
Use the graph of f to identify where f' and f'' are positive, negative, and zero.



Graph of f

Example 3:

Use the graph of f' to estimate where f is increasing and decreasing, where f has relative extrema, where f is concave up and concave down, and where f has inflection points.



Graph of f'

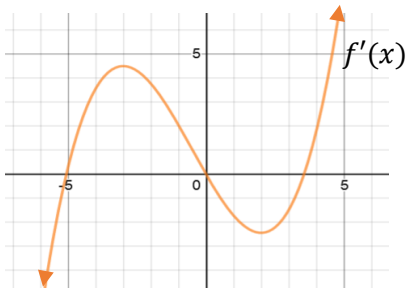
Example 4:

The table below gives values of $f'(x)$ and $f''(x)$ at selected values of x. Determine where $f(x)$ is increasing, decreasing, concave up, concave down and the x-value(s) of the extrema and the inflection points of $f(x)$.

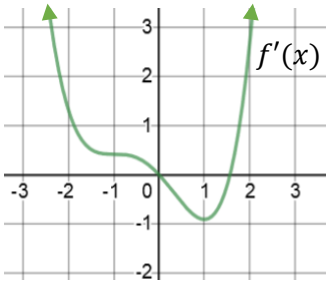
x	$(-\infty,-2)$	-2	$(-2,0)$	0	$(0,2)$	2	$(2,3)$	3	$(3,\infty)$
$f'(x)$	$+$	0	$+$	DNE	$-$	$-$	$-$	0	$+$
$f'(x)$	$-$	0	$+$	DNE	$-$	0	$+$	$+$	$+$

Given the graph of $f'(x)$, describe find where $f(x)$ is increasing and decreasing and where $f(x)$ is concave up and concave down.

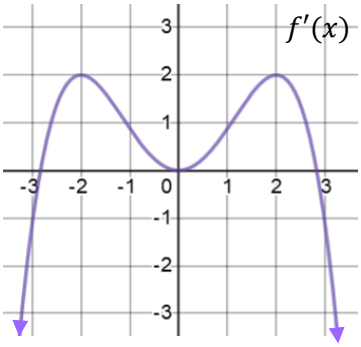
1.



2.



3.



4.