Graph Analysis Practice

Sketch a graph for the following:

1. $f(2)=f(4)=0$; $f(3)$ is defined; $f'(x)<0$ if $x<3$; $f'(3)$ DNE; $f'(x)>0$ if $x>3$; $f''(x)<0$ when $x\neq 3$.

2. $f(-3)=2, f(1)=2, f(5)=2$; $f'(-3)=f'(1)=0$; $f'(3)$ DNE; $f'(x)>0$ on $(-3,1)\cup(3,\infty)$; $f'(x)<0$ on $(-\infty,-3)\cup(1,3)$; $f''(x)>0$ on $(-\infty,-1)\cup(5,\infty)$; $f''(x)<0$ $(-1,3)\cup(3,5)$

3. $f'(x)<0$ on $(-\infty,-2)\cup(-2,2)\cup(2,\infty)$; $f''(x)>0$ on $(-2,0)\cup(2,\infty)$ $f''(x)<0$ on $(-\infty,-2)\cup(0,2)$; $\lim_{x\to 2^-} f(x)=-\infty$ $\lim_{x\to -2^+} f(x)=\infty$ $\lim_{x\to 2^-} f(x)=-\infty$ $\lim_{x\to 2^+} f(x)=\infty$; $\lim_{x\to -\infty} f(x)=-1$ $\lim_{x\to \infty} f(x)=1$.

4. f is cont. $[0,3]$ and satisfies the following.

x	0	1	2	3
f	0	2	0	-2
f'	3	0	DNE	-3
f''	0	-1	DNE	0

x	$0<x<1$	$1<x<2$	$2<x<3$
f	+	+	−
f'	+	−	−
f''	−	−	−

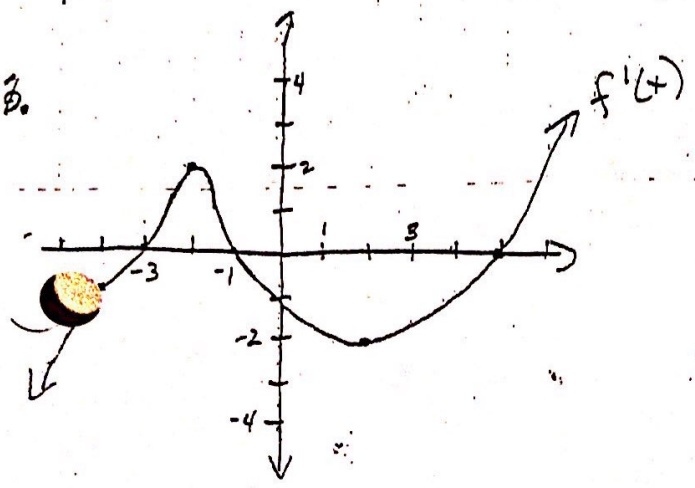
5. f is an even function, cont. on $[-3,3]$ & satisfies the following

x	0	1	2
f	2	0	-1
f'	DNE	0	DNE
f''	DNE	0	DNE

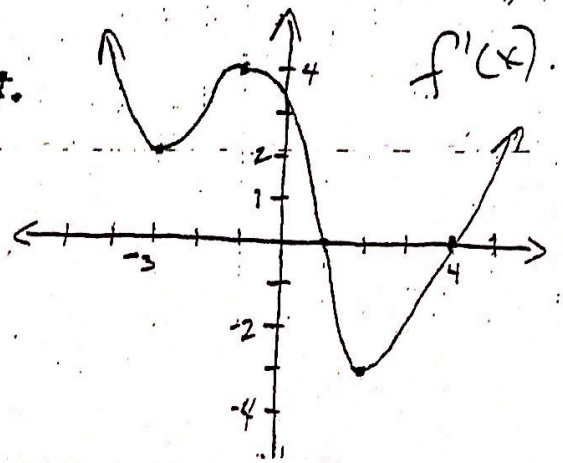
x	$0<x<1$	$1<x<2$	$2<x<3$
f	+	−	−
f'	−	−	+
f''	+	−	−

Given the graph of $f'(x)$, determine where $f(x)$ is increasing, decreasing, has extrema, concave up, concave down, & points of inflection. Justify your answers. Sketch $f(x)$

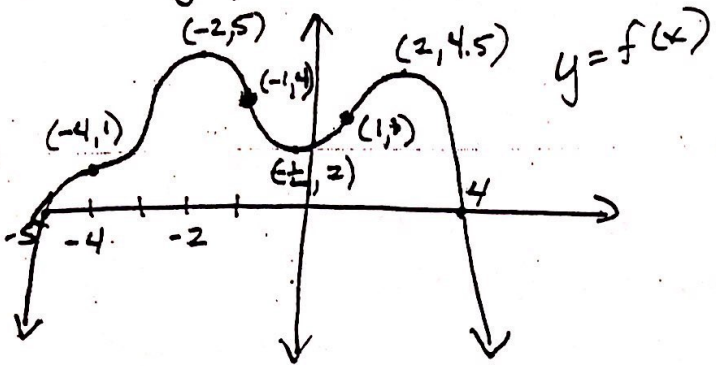
6.



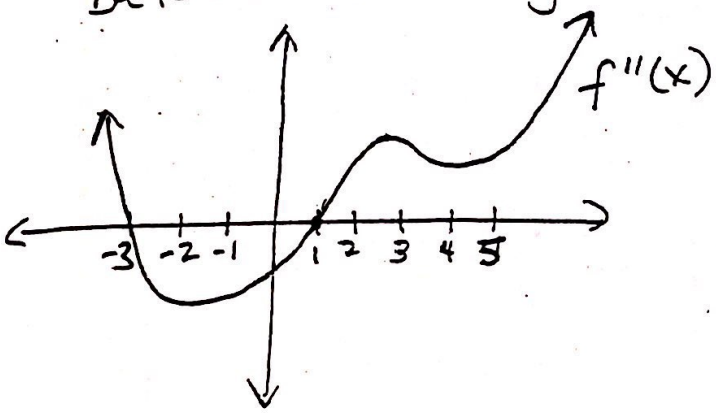
7.



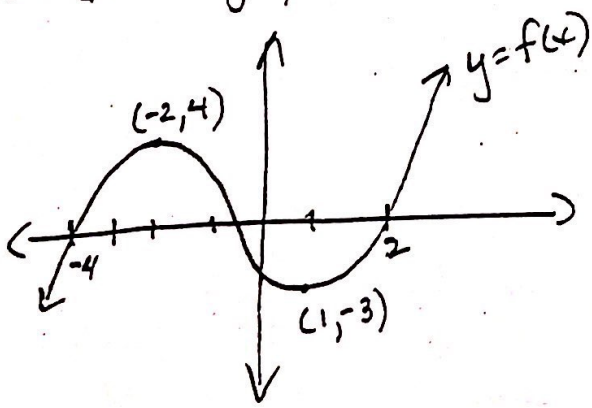
3. Given graph of $f(x)$, sketch $f'(x)$ and $f''(x)$.



7. Given graph of $f''(x)$, $f'(-2) = f'(1) = 0 = f'(4)$
Determine concavity of $f(x)$ and extrema of $f(x)$. Justify.



10. Given graph of $f(x)$, list following in ascending order:



a) $f(1), f'(1), f''(1)$

b) $f(-4), f'(-4), f''(-4)$