DATE: _____

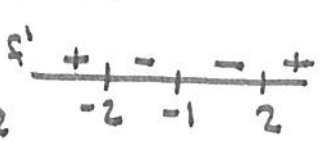
Given the following information about $f(x)$, which is continuous on [-3,3].

x	(-3,-2)	-2	(-2,-1)	-1	(-1,1)	1	(1,2)	2	(2,3)
f	+	4	+	3	+	0	-	-2	-
f'	+	DNE	-	0	-	-	-	0	+
f''	+	DNE	+	0	-	0	+	+	+

a) Find the x-coordinate(s) of each maximum or minimum of $f(x)$. Justify your answer.

f has rel. max @ x = -2 b/c
f' changes from pos to neg @ x = -2

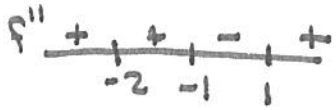
f has rel. min @ x = 2 b/c
f' changes from neg to pos @ x = 2



b) Find the x-coordinate(s) of any inflection points of $f(x)$. Justify your answer.

f has inf pt @ x = -1 and x = 1

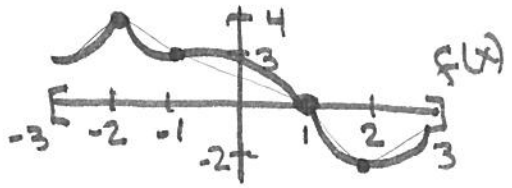
b/c f'' changes signs @ x = -1 & x = 1



c) On what interval(s) is the graph of $f(x)$ increasing and concave up?

f(x) inc and concave up on (-3,-2) ∪ (2,3)

d) Sketch a graph of f.

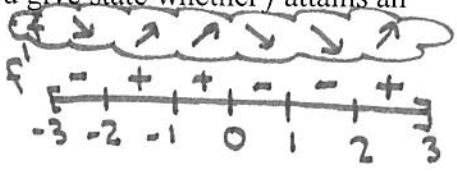


symmetrical about y-axis

Let f be a function that is even and continuous on the closed interval $[-3,3]$. The function f and its derivatives have the properties indicated in the table below.

x	0	$0<x<1$	1	$1<x<2$	2	$2<x<3$
$f(x)$	1	Positive	0	Negative	-1	Negative
$f'(x)$	Undefined	Negative	0	Negative	Undefined	Positive
$f''(x)$	Undefined	Positive	0	Negative	Undefined	Negative

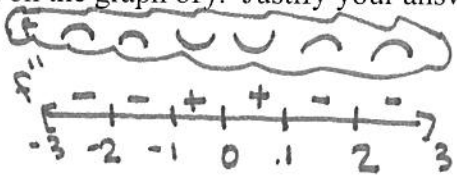
a) Find the x-coordinate of each point at which f attains an absolute maximum value or an absolute minimum value. For each x-coordinate you give state whether f attains an absolute maximum or an absolute minimum.



abs. max @ $x=0$
$(0,1)$
abs min @ $x=-2$ & $x=2$
$(-2,-1)$ and $(2,-1)$

b) Find the x-coordinate of each point of inflection on the graph of f. Justify your answer.

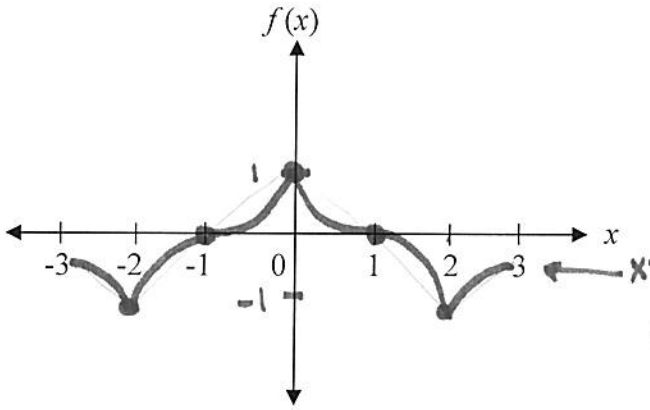
f''



f has inf pt @ $x=-1$, $x=1$

b/c f'' changes signs @ $x=-1, x=1$

c) In the xy-plane below, sketch the graph of a function with all the given characteristics of f.



$x=3$ must be negative b/c $(2,3)$ $f(x)$ negative