4.3 AP Calculus

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Name ______________________

period ______

On the interval $-4 < x < 4$

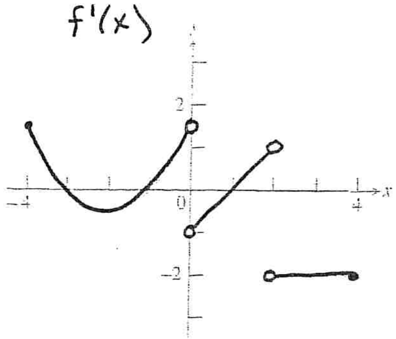


Figure 4.33 The graph of f', a discontinuous derivative.

Assume $f(x)$ is continuous even when $f'(x)$ is undefined

① At what values of x does $f(x)$ have a Local maximum? ______________________

② Justify your answer to ① above

____

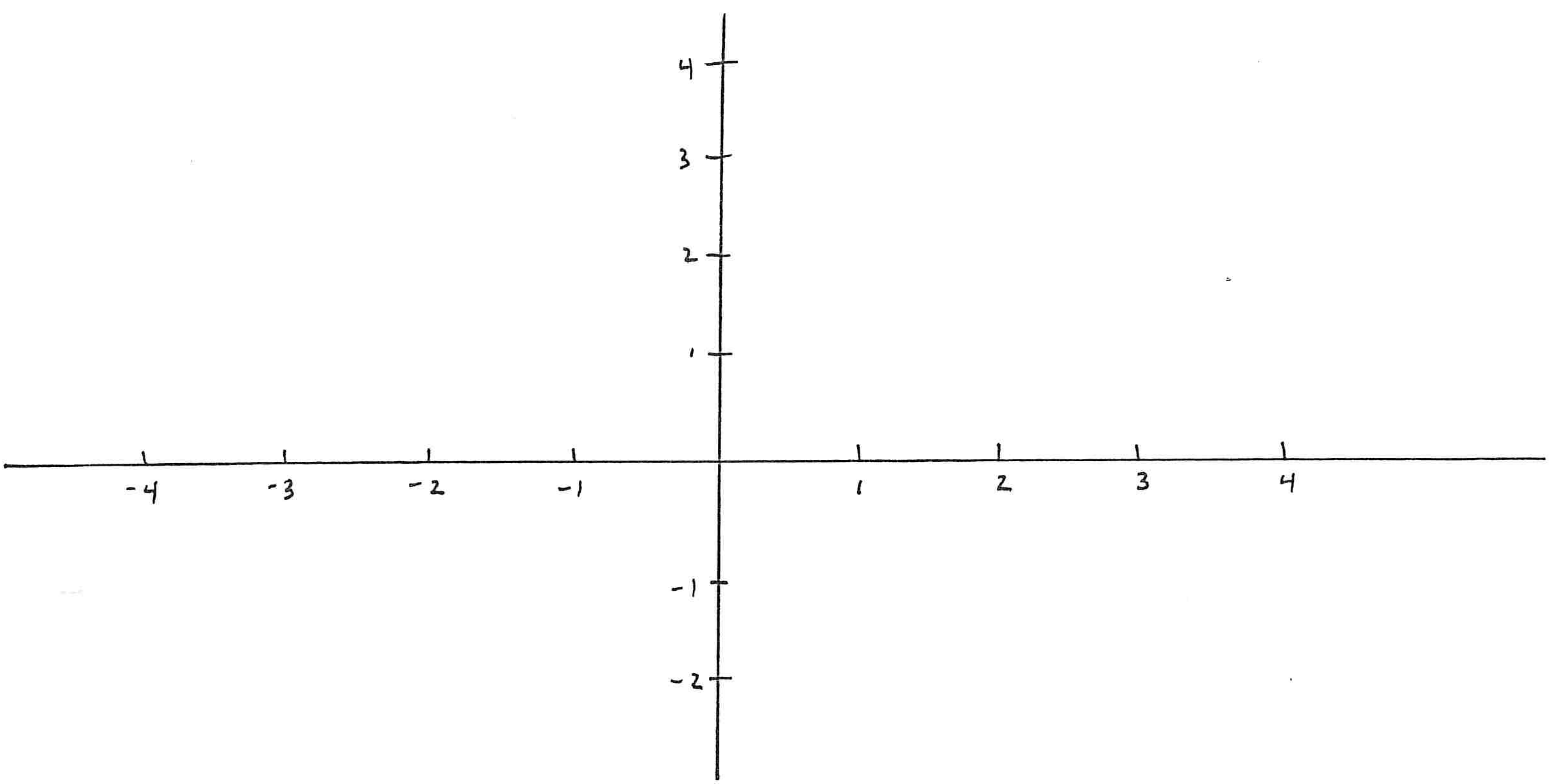
③ At what values of x does $f(x)$ have a Local minimum? ______________________

④ For what intervals is $f(x)$ concave down? ______________________

⑤ Justify your answer to ④ above

____

⑥ Sketch a possible graph of $f(x)$. $f(x)$ must be continuous with domain $[-4, 4]$ and $f(-4) = 1$ and $f(4) = -2$



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Name ______________

per ________

Answer each question and Justify your answers.

① On what intervals is f increasing?

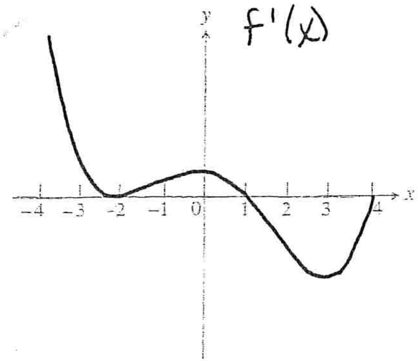


Figure 4.25 The graph of f', the derivative of f, on the interval $[-4, 4]$.

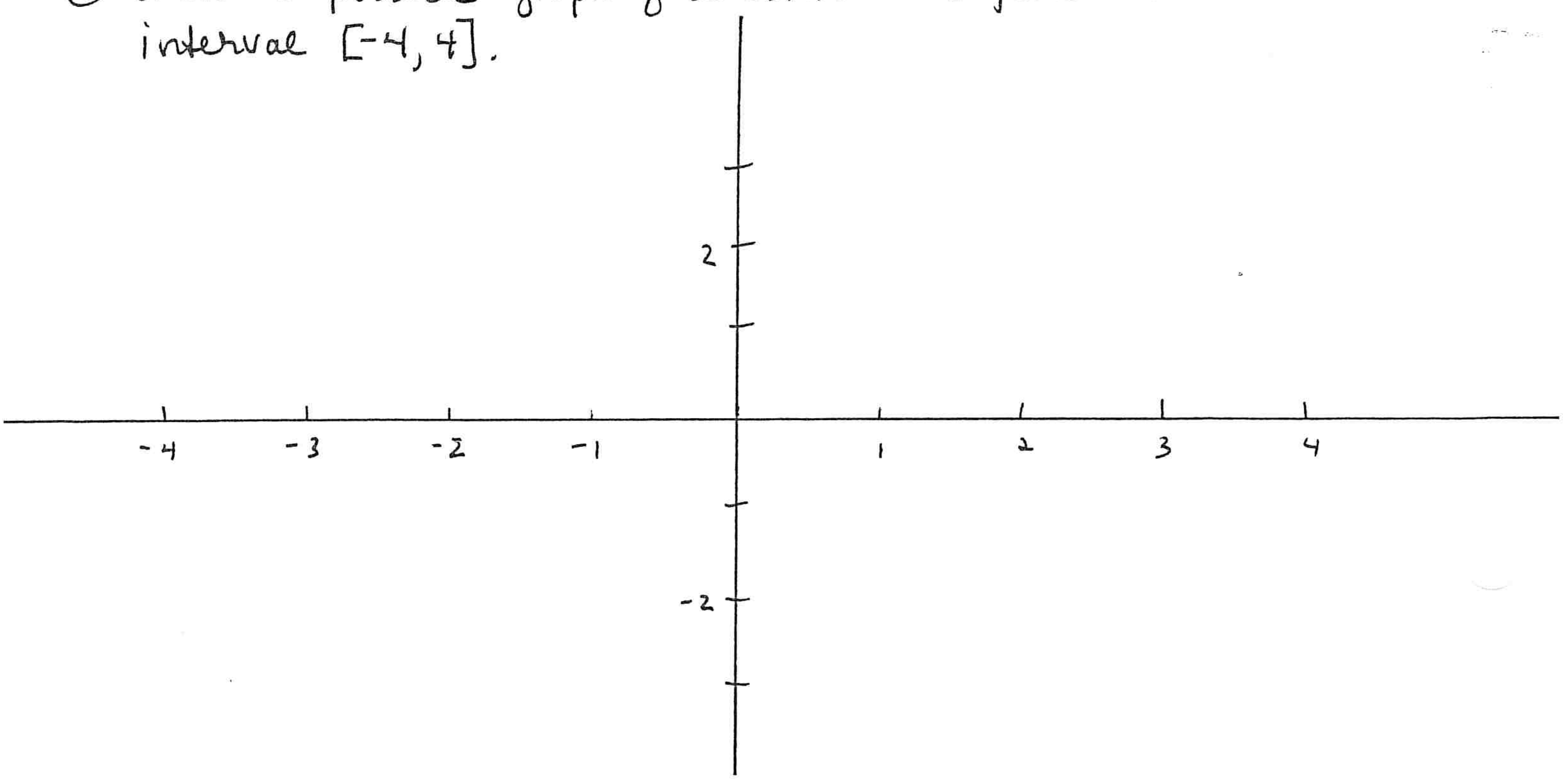
② On what intervals is f concave up?

③ At which x-coordinates does f have a local min?

④ At which x-coordinates does f have a local max?

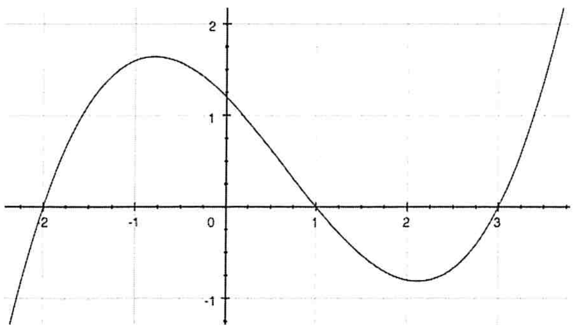
⑤ What are the x-coordinates of all inflection points of f?

⑥ Sketch a possible graph of a continuous function f on the interval $[-4, 4]$.



4 Corners

The graph of f' is below. At which x-value(s) does f have a relative minimum? Explain your reasoning.



The function f is a twice-differentiable function with selected values of f, f' and f'' given in the table below.

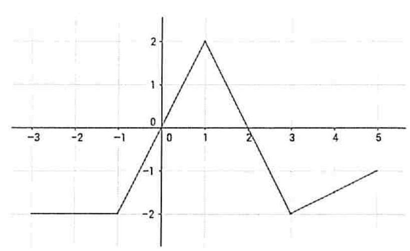
x	-3	2	4	5	9
f(x)	3	7	4	2	5
f'(x)	2	0	-1	0	-4
f''(x)	-1	3	2	-1	6

At which x-value(s) does f have a relative maximum? Explain your reasoning.

The function f is a differentiable function with $f'(x) = 3(x-2)^2(x+1)(x+4)$

At which x-value(s) does f(x) have a relative maximum? Explain your reasoning.

The functions f, g and h are differentiable functions with $h(x) = f\big(g(x)\big)$. The function f is a strictly positive and decreasing function. The graph of g'(x) is given below.



At x = 2, does h(x) have a relative minimum, maximum or neither. Explain your reasoning.