Jump f' is undefined at $x=-1$ (cusp/corner)

(-3, +1)

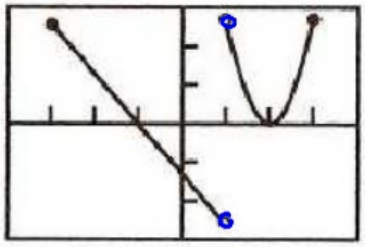
f' is linear

f is quadratic

8. Sketch a possible graph of a continuous function f that has domain [-3, 3], where f(-1) = 1 and the graph of y = f'(x) is shown below.

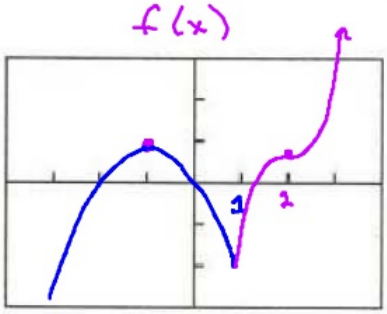
(-1, 1)

$f'(x)$



[–4, 4] by [–3, 3]

$f(x)$



[–4, 4] by [–3, 3]

(-3, -1) $f'>0$ (above) → f increasing

(-1, 1) $f'<0$ (below) → f decreasing

(1, 2) $f'>0$ (above) → f inc

$x=2$ $f'=0$ (Horizontal Tan) → flat spot

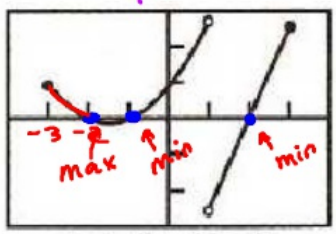
(2, 3) $f'>0$ (above) → f inc

9 Sketch a possible graph of a continuous function f that has domain [-3, 3], where f(-1) = -1 and the graph of y = f'(x) is shown below.

x-int on f'

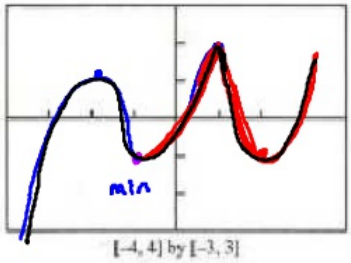
max/min on f

f'



[–4, 4] by [–3, 3]

f



[–4, 4] by [–3, 3]

(-3, -2) $f'>0$ f inc

(-2, -1) $f'<0$ f dec

(-1, 1) $f'>0$ f inc

$x=1$ f' und f cusp

(+1, 2) $f'<0$ f dec

(2, 3) $f'>0$ f inc

p. 107 #27 Sketch the graph of a continuous function f with f(0) = -1 and

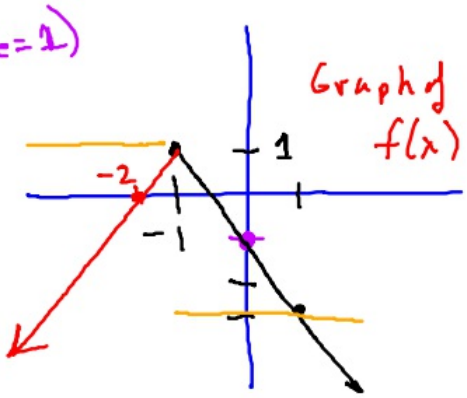
$$f'(x)=\begin{cases}1, & x<-1\\ -2, & x>-1\end{cases}$$

→ Left
→ Right

(0, -1)

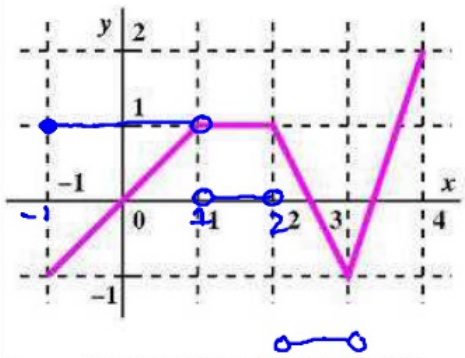
(-∞, -1) $f'=1$ (slope = 1)

Right ← (-1, ∞) $f'=-2$



The graph of the function f(x) is shown here is made of line segments joined at each end.

Graph f'



(-1, 1) $f'>0$
$f'=1$

(1, 2) $f'=0$

(2, 3) $f'=-2$

(3, 4) $f'=3$

a. Graph the functions derivative.

b. At what values of x between x = -1 and x = 4 is the function not differentiable?

corners on f
jumps on f' > x = 1, 2, 3