Ex 252 Sketch the graph of $y = x^2 - 2x - 3$

(1) x-int → $y = 0$ → $0 = x^2 - 2x - 3$

$= (x-3)(x+1)$

$x = -1, 3$

↳ $(-1, 0)$, $(3, 0)$

(2) y-int → $x = 0$ → $y = (0)^2 - 2(0) - 3 = -3$

$(0, -3)$

(3) VA → no values of x make y undefined

→ NO VA

(4) HA → $\lim_{x \to \infty} x^2 - 2x - 3 = \infty$

$\lim_{x \to -\infty} x^2 - 2x - 3 = \infty$

→ NO HA

(4) C.P. $y' = 2x - 2 = 2(x-1)$

$0 = y' = 2(x-1)$ → $x = 1$

$y(1) = (1)^2 - 2(1) - 3 = -4$

$(1, -4)$

⑤ P.I. $y'' = 2 \rightarrow 0 = y'' \rightarrow$ no sol'n

$\rightarrow$ NO PI

⑥ OK

⑦ MAX/MIN : AKA → SECOND DERIVATIVE TEST

ⓐ $x = 1$ $\quad y''(1) = 2 > 0$

$\therefore (1;4)$ is a MIN

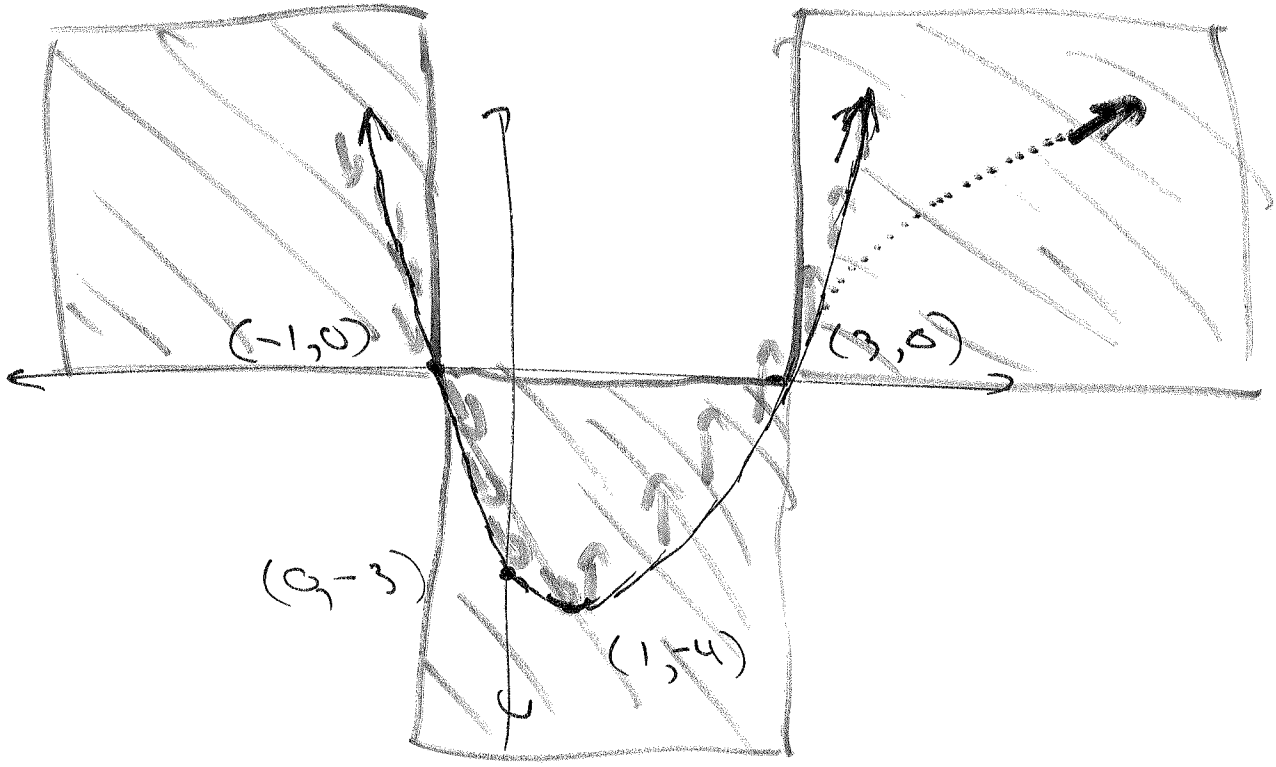
⑧ OK

⑨

	$x+1$	$x-3$	y
$(-\infty,-1)$	−	−	+
$(-1,3)$	+	−	−
$(3,\infty)$	+	+	+

	$x-1$	y'
$(-\infty,1)$	−	−
$(1,\infty)$	+	+

	2	y''
$(-\infty,\infty)$	+	+


(-1,0)
(3,0)
(0,-3)
(1,-4)
y