

"POP" EXERCISE II

(2)

FIND ALL LOCAL EXTREMA OF THE FUNCTION

$$f(x) = \frac{x-1}{x^2-2x}$$

SOLUTION.

FIND CRITICAL pts.

$$f'(x) = \frac{1(x^2-2x) - (2x-2)(x-1)}{(x^2-2x)^2}$$

$$= \frac{(x^2-2x) - (2x^2-4x+2)}{(x^2-2x)^2} = \frac{-x^2+2x-2}{(x^2-2x)^2}$$

WHEN DOES $f'(x) = 0$?

WHEN $-x^2+2x-2=0$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a} = \frac{-2 \pm \sqrt{2^2-4(-1)(-2)}}{2(-1)}$$

$$= \frac{-2 \pm \sqrt{-4}}{-2}$$

NO SOLUTIONS

SO $f'(x)$ IS NEVER 0

WHEN DOES $f'(x)$ NOT EXIST?

WHEN $(x^2-2x)^2 = [x(x-2)]^2$

SO WHEN $x=0$ & $x=2$

INTERVALS	$(-\infty, 0)$	$(0, 2)$	$(2, \infty)$
TEST POINT	-1	1	3
Sign of f'	-	-	-
BEHAVIOR OF f	↓	↓	↓

THERE ARE NO RELATIVE EXTREMA