

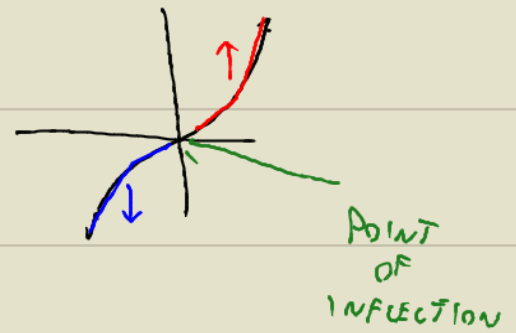
$$1. \quad y = -x^3 + 5x^2 - 4$$

DETERMINING CONCAVITY

① FIND SECOND DERIVATIVE

$$y' = -3x^2 + 10x$$

$$y'' = -6x + 10$$



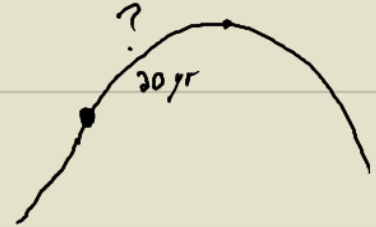
② SET SECOND DERIV. EQUAL TO ZERO AND SOLVE

$$-6x + 10 = 0$$

$$10 = 6x$$

$$\frac{10}{6} = \frac{6}{6}x$$

$$\frac{5}{3} = x \quad \text{CRITICAL NUMBER}$$



③ USING CRITICAL NUMBER(S) BUILDS A TABLE OF INTERVALS, PICK TEST CASES, PLUG INTO SECOND DERIV. AND SIMPLIFY

POS ☺ CONC UP	NEG ☹ CONC DOWN
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	$-\infty$	$x = \frac{5}{3}$	∞
TEST CASES	$x=0$	$x=3$	
PLUG INTO y''	$-6x+10$	$-6x+10$	
	$-6(0)+10$	$-6(3)+10$	
	10	$-18+10$	
	☺	☹	

CONC UP $(-\infty, \frac{5}{3})$

CONC DOWN $(\frac{5}{3}, \infty)$