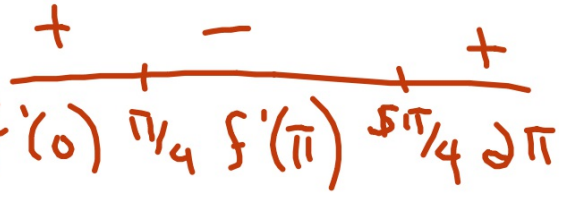
41. $f(x) = \sin x + \cos x \quad (0, 2\pi)$

$0 = \cos x - \sin x$

$\sin x = \cos x$

$\pi/4, 5\pi/4$



Inc: $(0, \pi/4) \cup (5\pi/4, 2\pi)$

Dec: $(\pi/4, 5\pi/4)$

24. $f(x) = (x+2)^2(x-1)$

$(x^2+4x+4)(x-1)$

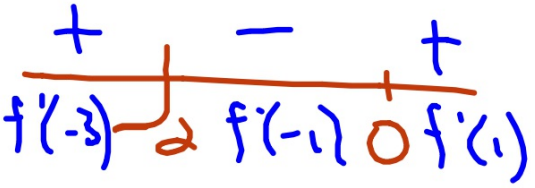
x^3+4x^2+4x

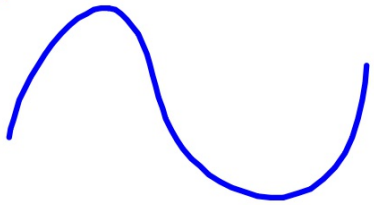
$-x^2-4x-4$

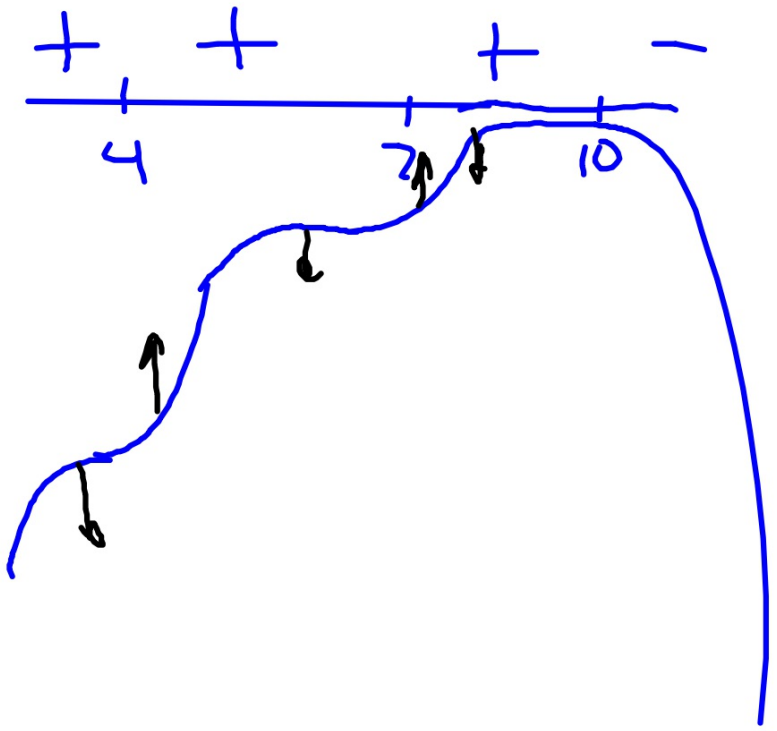
x^3+3x^2-4

$0 = 3x^2+6x$

$= 3x(x+2)$






+
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4
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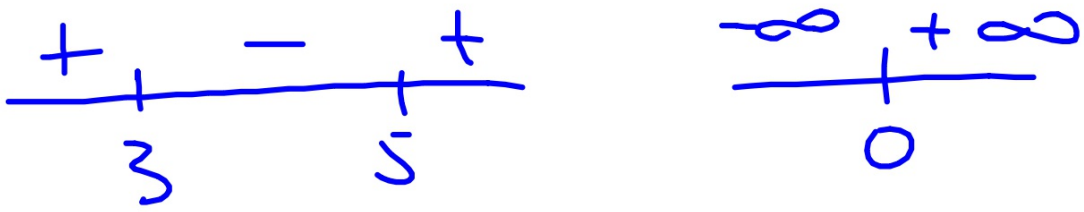
10



Inc: $(-\infty, 3) \cup (5, +\infty)$

Dec: $(3, 5)$

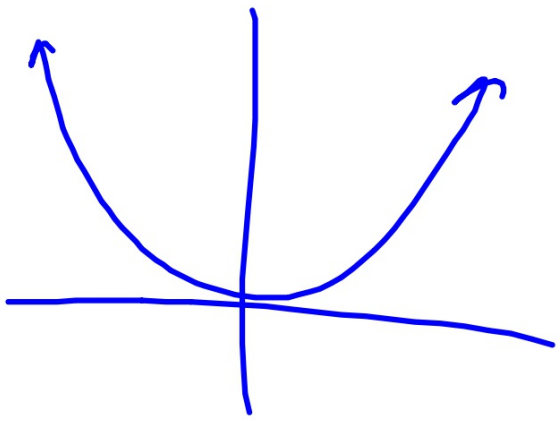
24. x

3.4A. Concavity

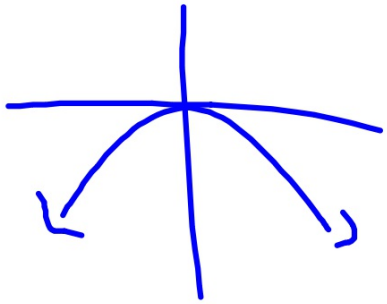
A. Concavity - a description of the change of the derivative

- Concave "Up"
- Concave "Down"

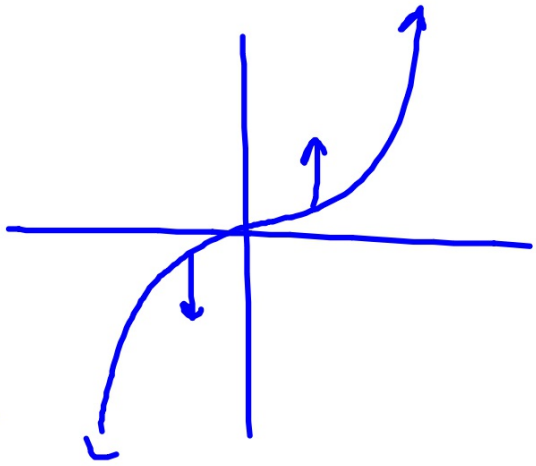
Ex. $f(x) = x^2$



$f(x) = -x^2$



Ex. $y = x^3$



CU: $(0, +\infty)$

CD: $(-\infty, 0)$

$y' = 3x^2$

$y'' = 6x$

$0 = 6x$

$x = 0$

$-$		$+$
$f''(-1)$	0	$f''(1)$