2.9

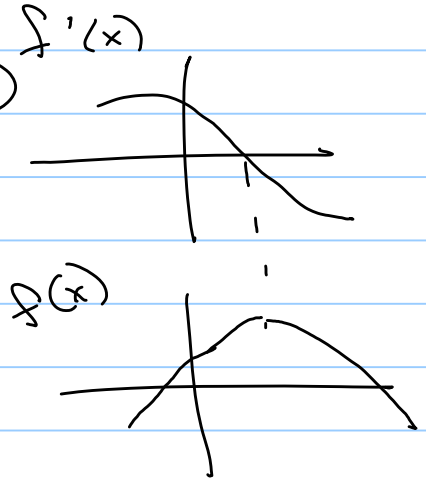
Note Title 8/7/2007

What does f' say about f?

if $f'(x) > 0$ on an interval then f is increasing on that interval

if $f'(x) < 0$ on an interval then f is decreasing on that interval

ex.



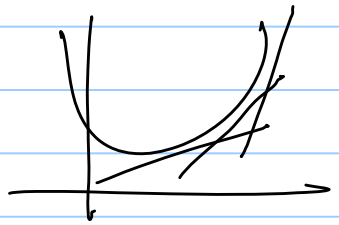
When $f'(x) = 0$ $f(x)$ has a local min or max

ex.

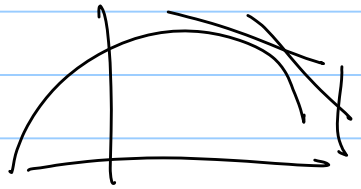
What does f'' say about f?

If $f''(x)$ is positive $\Rightarrow$ $f'(x)$ is increasing
$\Rightarrow$ slopes of tangent lines of $f(x)$ increase from left to right

ex)



$f''(x) > 0$
tangent lines ↗

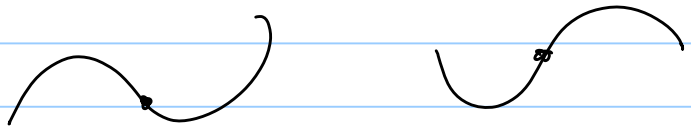


$f''(x) < 0$
tangent lines ↘

if $f''(x) > 0$ on an interval then f is concave up on that interval.

if $f''(x) < 0$ on an interval then f is concave down on that interval.

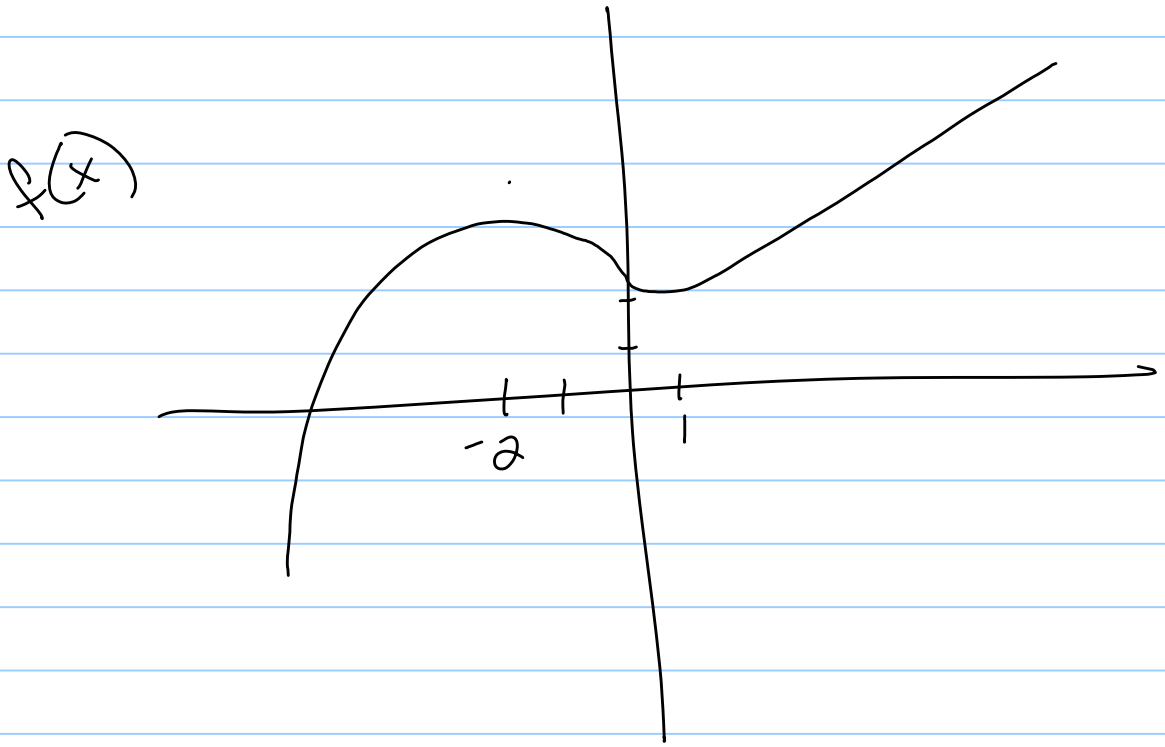
Inflection point - where graph switches from concave up to concave down (or vice versa)



(ex.) Sketch a possible graph of $f(x)$

$f'(x) > 0$ when $x < -2$ or $x > 1$

$f''(x) < 0$ when $x < 1$



~~Antiderivatives~~

"undo" derivative. I give you essentially $f'(x)$ and ask you questions about $f(x)$