

Section 4.4

$$f'(x) = + \rightarrow \text{increasing}$$
$$f'(x) = - \rightarrow \text{decreasing}$$

Concavity

$$f'' = + \rightarrow$$

$$f'' = - \rightarrow$$

concave up \rightarrow 

concave down \rightarrow 

\hookrightarrow tangent lines are above

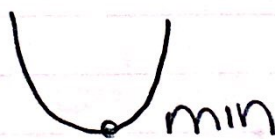
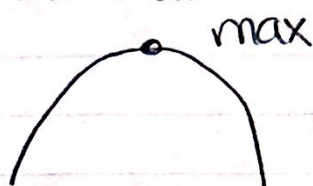
tangent lines are below

- Inflection Point

\hookrightarrow where
 \rightarrow changes

$f'' = 0$ or $f'' = \text{DNE}$
from concave \uparrow to \downarrow

Extrema and concavity



Section 4.5

L'Hôpital's Rule - if you have limit = $\frac{0}{0}$ or $\frac{\infty}{\infty}$

Remember

$$f \cdot g = \frac{f}{1/g}$$

Then: you can take the derivative of the top & bottom separately and still get the limit

ex $\lim_{x \rightarrow 0^+} (x \ln x) = \lim_{x \rightarrow 0^+} \frac{x}{1/x}$