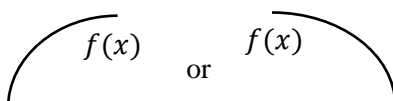


4.3 Connecting f' and f'' with the Graph of f

CONCAVITY

* f is concave up 

f is concave up \rightarrow \rightarrow

* f is concave down 

f is concave down \rightarrow \rightarrow

Test for Concavity

f'' must exist!

① Find where $f'' = 0$ or f'' DNE

② If $f'' > 0$, then f is

If $f'' < 0$, then f is

③ Inflection points occur where concavity changes

Example 1

Find where $h(x) = 3x^2 - x^3$ is concave up and concave down and the inflection point(s) of $h(x)$ (if any).

Example 2

Find where $g(x) = xe^x$ is concave up and concave down and the inflection point(s) of $g(x)$ (if any).

Example 3

Find where $f(x) = x^{2/3}$ is concave up and concave down and the inflection point(s) of $f(x)$ (if any).