Concavity

1. Concave up & down.

concave up

concave down.

2. Definitions

Let f be a differentible function defined on an inteval I.

f is ___ on I:

1) Concave-up: when f' is increasing on I.
2) Concave-down: when f' is decreasing on I.
3) Let c be an interior point to I. f has an inflection point at c, when: f changes concavity at c.

3. Theorem.

1) Let I be an open inteval

Let f be a tivice-differentiable function defined on I

① If $\forall x \in I$. $f''(x) > 0$, then f is concave up on I.

② If $\forall x \in I$. $f''(x) < 0$. the f is concave down on I.