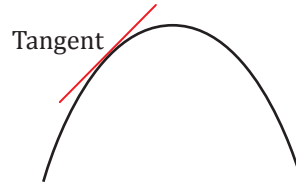


Concave and convex sections of curves

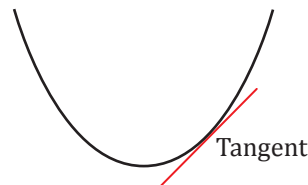
It is important to be able to distinguish between concave and convex sections of curves. Look at the following, which explains how to tell whether a particular section of a curve is convex or concave.

Concave section of curve.

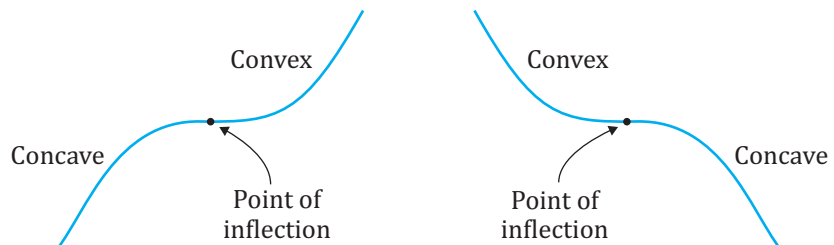


Wherever the tangent is drawn, the tangent line is **above** the curve
Concave = \cap (think of a frown)

Convex section of curve.



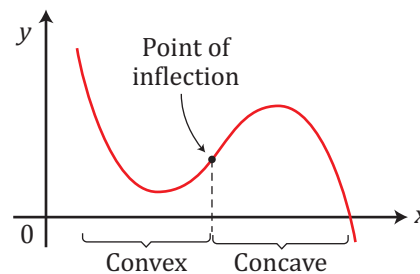
Wherever the tangent is drawn, the tangent line is **below** the curve
Convex = \cup (think of a smile)



A point of inflection exists when a curve changes from convex to concave or *vice versa*.

In the graph below, as the value of x increases, the graph changes from convex (a smile shape) to concave (a frown shape).

When this happens there is a point of inflection between the two sections and the sign of the second derivative ($\frac{d^2y}{dx^2}$ or $f''(x)$) changes either side of the point of inflection.



When you think you have found a point of inflection you must always check if $\frac{d^2y}{dx^2}$ changes sign either side of the suspected point of inflection.