

**Concavity:** Suppose that  $f''(x)$  exists on the interval  $(a, b)$

1. If  $f''(x) > 0$  in  $(a, b)$ , then  $f$  is concave upward in  $(a, b)$ .

2. If  $f''(x) < 0$  in  $(a, b)$ , then  $f$  is concave downward in  $(a, b)$ .

To locate the **points of inflection** of  $y = f(x)$ , find the points where  $f''(x) = 0$  or where  $f''(x)$  fails to exist. These are the only candidates where  $f(x)$  may have a point of inflection. Then test these points to make sure that  $f''(x) < 0$  on one side and  $f''(x) > 0$  on the other.